Residential Mobility in the Local Authority Housing Sector in Edinburgh, 1963 - 1973.

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Declaration

This thesis has been composed by me and is based on my own research.

ABSTRACT

This thesis examines the pattern and process of mobility as found in the Local Authority housing sector in Edinburgh between 1963 and 1973. The data for the study were extracted by a 10% sample of the 'records of let' held by Edinburgh City Housing Department. A profile of facts about each household was extracted every time a change of residence occurred. This provided details of the movement of new tenants into the public sector and of movement between and within estates.

New tenants were found to be a combination of two distinct groups. This had consequences for the spatial pattern of moves into the public sector and influenced both the distance and direction of movement. Sectoral biases were, however, not evident for either group.

The nature of estates in terms of their physical and social composition, was seen to be highly dependent on their legislative background, while these differences were reinforced by institutional constraints and biases in the allocation system. The popularity of estates was measured in terms of the number of points required for entry and only those applicants who could command high levels of points or special priorities had a chance of obtaining places in the best areas.

The movement of tenants between these estates was, in general terms, one of movement towards the most popular areas, although such estates were relatively small and

therefore unable to absorb the total demand. Spatial patterns of movement between estates were very parochial with ten sub-systems being identified. This pattern of local movement suggested that distance was an important element constraining transfers and such an influence was later confirmed.

Movement at the within estate level was to more popular parts and to newer areas. Transfer tenants moving at these different levels varied in their demographic characteristics as well as in their motivations for moving.

Differences in motivation were evident for all groups. Family Life Cycle influences were shown to be the most important in promoting mobility, while Involuntary reasons formed the second most important category. The reasons given for moving determined the category of need into which tenants were placed and the number of points awarded to them. This, together with the ability to wait, effectively determined their chances of obtaining rehousing in any estate. Young household heads with young families therefore tended to be concentrated in the less popular estates while older household heads were more often allocated to the more popular areas.

Throughout the study the patterns and processes of mobility were shown to be highly complex, even for such a seemingly uniform group as local authority tenants.

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CHAPTER ONE

INTRODUCTION

The present study presents an investigation of the patterns and processes of residential mobility in the Local Authority housing sector in Edinburgh during the period 1963 to 1973. There were several reasons why this topic was thought to be of value. Initially, the stimulus for a study in this area came from a realization that migration studies of any nature are now recognized as being one of the most important aspects of contemporary research on population (Kosiński and Prothero, 1975).

Despite the early recognition of the importance of the process of mobility by Ravenstein in 1885 there was little development in such studies until the 1960's. The growth of interest in migration research since then can be seen on the one hand as a response to the demand of planners for improved data, and on the other, due to an increasing awareness within the social sciences of a need for basic research into the process of mobility at both a disciplinary and an inter-disciplinary level (Welch, 1970). Even to date, migration findings are frequently a by-product of other research and as such, any information found is incidental and tangential to the main issues being studied. Relatively few studies have focussed on the migration process *per se*, most preferring to illustrate the effects of migration on the areas of origin and destination. Those studies of the early 1960s tended to raise as many problems as they

answered which created additional demands for deeper analysis of motivations and mechanisms and more refined information on the spatial aspects and characteristics of migrants (Willis, 1974).

As studies have become more numerous and varied, several distinct streams of research have developed with different aims and approaches. Foremost among these has been the study of intra-urban migration. It is hardly surprising that this is now an important topic for study when it is realized that approximately two-thirds of all the moves in both the U.S.A. and Britain are now intra-urban (Simmons, 1968; Herbert, 1972). The importance of intra-urban mobility, however, does not rest entirely on its volume. Its consequences for urban structure are also profound, as changes in the residential pattern of a city cannot occur independently of migration (although the latter may take place within a stable residential structure) (Johnston,1971). Residential mobility at this urban scale has now therefore come to be recognized as a potentially crucial process in the formation of residential patterns and in understanding the overall socio-spatial structure of cities (Herbert, 1972).

With the importance of this process in mind and the knowledge that there was a general lack of such studies in British cities, it became possible to narrow down the topic for the present research. Given the decision to proceed in the general area of intra-urban mobility several other reasons suggested an even more precisely defined topic.

As the majority of earlier studies had been carried out in the U.S.A. there were likely to be some notable differences in a similar research project in Britain. Firstly, it was evident that the role of the local authority housing sector in modern British cities would present a major difference. The local authority areas have had a profound effect on the internal structure of urban areas and their effects are not always uniform nor stable. In terms of intra-urban mobility the council housing sector tends to operate in the movement pattern of the city in a similar manner to the way in which it functions within the housing market. It forms an extremely well-connected sub-system which has only irregular links with the rest of the city and its housing system (Pritchard, 1972). Once a tenancy is gained within the council sector there is little movement out to other forms of tenure with owner-occupancy forming a real alternative in only a small number of cases. Also, as council tenants include relatively few of the oldest and youngest households and very few single households there is a natural tendency for there to be little loss from this sector. However it is likely that people already in council houses move as often as the rest of the population (Donnison, 1967). Local authority housing therefore forms an important part of the housing system in Britain and a sub-system about which little is known.

As the American studies had also shown that renters were consistently more mobile than owners (Grigsby, 1963)

and that mobility was several times higher in low value housing than in high value areas (Boyce, 1969), then the potential for high levels of mobility within the public sector seemed to justify study. Finally, the importance of institutional constraints in influencing residential mobility, suggested that a study within the public housing sector, where constraints were greater than in private housing, would be worthwhile. These combined influences then provided the rationale for the choice of the present topic and when data sources were found to be available, relatively detailed and reliable for the City of Edinburgh, the study topic was finally determined.

The choice of a Scottish city, and Edinburgh in particular, was not only for convenience but also because less is known about the intra-urban mobility process in Scotland than for British cities as a whole. Edinburgh's size (463,900 of a population as estimated for 1977) made it comparable to other British cities and more amenable to study for an individual research worker than Glasgow which was felt to be too big.[1] Unfortunately in choosing Edinburgh as the place of study one is dealing with an atypical case for Scottish cities regarding the amount of housing in the public sector. At 33% of all housing in Edinburgh, the public sector is smaller than that in any of the other major urban districts in Scotland and Edinburgh has the lowest proportion by far of the four major cities.

1 A study into intra-urban mobility commissioned by the Scottish Development Department and carried out by the Department of Town and Regional Planning of Glasgow University was made for 1974 data for Glasgow but, at time of writing, these results have not been on general release.

The public sector in Glasgow forms 63% of the city's total housing stock and Aberdeen and Dundee have 51% and 59% respectively (The Scotsman, 26.6.79). Nevertheless, the availability of data in Edinburgh for such a study had to take precedence over this drawback.

Given the rationale behind the study and the aim of assessing the patterns and processes of intra-urban mobility within the local authority housing sector in Scotland the study had to pose three major types of questions, viz.:

1) what are the patterns of flow and the directions of movement,

2) who moves, and

3) why do they move?

In setting about answering these queries it is essential to examine past studies of migration to discover the most fruitful methods of study and approaches to the problem. This is done in Chapter 2 which also assesses the relevant influences on mobility and how these act to produce movement. The data used in the present study are also discussed here.

Before proceeding to analyse the movement patterns in Edinburgh it was felt to be essential to look at the structure of the space within which these moves were taking place. To this end, Chapter 3 describes a component analysis which was carried out for the city of Edinburgh from the 1971 census data. This attempts to pick out areas within the city which are similar in terms of socio-economic status, demographic structure, type of housing and other discriminating variables. The principal aim of this analysis is

to distinguish from which types of areas the new tenants of the local authority housing sector are drawn. This intake of new tenants is the main interface of the public housing sector with other housing sub-systems and as such the types of areas involved are important. The typology for the city which is developed in Chapter 4 is used to assess this intake of new tenants on an ecological level. A description at the individual level is also carried out to differentiate the types of households which are involved. This chapter also develops the question of the pattern of flows and the direction of movement of new tenants. Tests for distance, directional and sectoral biases are all made in an attempt to judge whether movement is constrained by distance, location of home prior to moving and the location of place of employment.

The background of local authority housing is examined in Chapter 5 to illustrate the effect of past legislation on the present day social structure and physical environment of Edinburgh's council housing estates. The variation between local authority estates in terms of age, type of construction, demographic composition and popularity for current and prospective tenants is then illustrated and the allocations system with its inherent inequalities is also discussed.

Transfers between the estates are examined in Chapter 6 and here both the physical pattern of the moves and the types of estates left and entered are described. The importance of distance as an influence on levels of mobility

is again considered. Further, an assessment of the results of the present allocation patterns in terms of the future distribution of population in the local authority estates is made by a Markov Chain analysis. This is compared with the patterns which would result if the free choice of tenants were to be realized and continue unaltered through time.

On a smaller areal scale, the movement of tenants within estates is traced in Chapter 7. Comparisons are made between those moving within and those moving between estates to determine whether movements at both levels can be attributed to a similar process. Four estates are picked out for detailed examination and the moves within them are related to the relative popularity of different parts of the estates, the variations in environmental quality and the age of housing in these areas. An assessment of the level of satisfaction gained by these short distance moves is also made and compared for new and transfer tenants.

Chapter 8 is specifically concerned with answering the question of why people move. In looking at this problem the motivations of both new and transfer tenants are examined. It is here that the role of institutional constraints is most obvious with the necessity of applicants and tenants to qualify in terms of 'need', as defined by the local authority, before a successful move can be made. Variations in the reasons given for moving by households at different stages of the life cycle, with different ages of household head or other socio-economic and demographic

differences are investigated. Reasons given are also compared for households with different destinations for variations in points levels were thought likely to result in differential access to estates.

The penultimate chapter which makes comparisons of movers and non-movers suffers from problems of data comparability and although this part of the study is on the whole less satisfactory, it was felt to be worthy of inclusion because of the general scarcity of studies in this particular field especially in a local authority context. This is followed by the conclusion which draws the threads of the thesis together, picks out the relevant contributions to general migration research and suggests several areas where it is felt that there is adequate scope for further research in this field.

However, it is with the existing knowledge of the process of mobility and past research with which the next chapter is principally concerned.

CHAPTER 2

BASIC APPROACHES IN MIGRATION RESEARCH

Introduction

In discussing the problems of migration analysis Willis (1974) noted that "...the most striking feature of all migration studies is their diversity, not only in terms of scale, coverage and data collection but also in the use of the data, aims and methods of research." (Willis, 1974, p. 7). The objective of this chapter is to outline these various approaches to the study of migration and mobility[2] and thus to place in context the current research into intra-urban mobility in Edinburgh's public housing sector.

As the study of intra-urban mobility is only one aspect of the wider study of population migration this summary will not be exclusively concerned with this micro-level but will also refer to studies on a larger areal scale. Many of the approaches and techniques used at an urban scale have been adapted from studies at the inter-regional and international scales and an awareness of this development would seem to be important in the present context.

Basic Approaches

Past studies of migration can be subdivided into three broad categories in terms of method of approach but these are by no means mutually exclusive:

2 In this thesis the terms migration and mobility are taken to be synonymous, although the latter term will tend to be used when referring to movement over shorter distances.

I Those involving the construction of mathematical models and the use of multivariate techniques.

II Those of an ecological approach using aggregate data primarily from official sources such as the census.

III Those with a behavioural approach where emphasis is on the individual migrant.

The more recent studies, including the present, do not fall clearly into any particular group but incorporate aspects of all three approaches.

I The Use of Mathematical Models and Multivariate Techniques

The use of mathematical concepts and multivariate techniques has not been wholly successful in mobility analysis. Most of the early ideas describing the regularities in migration were modifications or elaborations of Ravenstein's 'Laws of Migration' and focused primarily on his first concept that "... the majority of migrants proceed only a short distance" (Ravenstein, 1885, p. 198). This problem of the relation of distance to volume of migrants has been approached in two different ways, viz:

1) the fitting of a curve to the data to give generalization, and

2) the setting up of hypotheses based on a set of plausible assumptions, the subsequent formulation being tested with observations (Hägerstrand, 1957).

In the fitting of a curve, migrations are grouped into circular distance zones from their origins and the resulting numbers of migrants are found to be in proportion to the total population within each zone. Migrations are then expressed

in relation to a standard population to give a smoothing of the values. Taking an example, the Pareto curve then uses the formula of $y = ax^{-b}$ where 'y' is the number of migrants, 'x' is the distance and 'a' and 'b' are constants. The question of the value of exponent 'b' has caused much debate. Hägerstrand (1957) showed that the value of the exponent decreased through time due to the improvement in transport technology and also varied between occupational groups with academics being much less constrained by distance than other workers.

Kulldorf (1955) in his examination of three different functions to describe migration, found that the Pareto curve fitted less well than the other two which were the exponential and the logarithmico-normal. The greatest weakness of the Pareto formula is that it over-estimates migrations over short distances for as 'x' tends towards zero 'y' tends to infinity.

The second type of approach was based on analogies from the physical sciences and these have been grouped under the general descriptive term of 'gravity model studies'. Following on Ravenstein's hypotheses the first real development in this direction was made by Young in 1928. He suggested that the relative volume of migration to a given destination from each of several source areas varied directly with the 'force of attraction' of the destination and inversely with the square of the distance between the source and the destination. Subsequent developments were made by Zipf and Stewart in the 1940s when they applied and

tested empirically their formulations of the gravity concept. Zipf proposed that when unemployment and income were uniformly distributed over the areas, the variable in the numerator i.e. the 'force of attraction' should be the population sizes of the areas involved (Carrothers, 1956).

Many modifications of both the population and distance factors have been made since those early studies. Dodd (1950) in his 'Interactance Hypothesis' introduced variables other than those of population numbers and distance making multipliers of the basic variables in order to account for differentials in sex, income, education and other characteristics. The distance factor, in particular, has been the subject of much debate. Empirical evidence has suggested that the impact of distance is not uniform and that its relationship in the basic equation is one in which distance is raised to some power other than unity. Hägerstrand (1957) reflected that the change of value of exponent 'b' in various studies from -2 to -1 might be a function of actual regional differences between Europe and America respectively, with the latter having less steeply sloping gradients of migration and communication fields owing to better transport networks. It has even been suggested that the exponent may be a variable function related inversely to distance itself, where the friction against interaction caused by short distance moves is disproportionately greater than the friction per unit of distance caused by longer distances. For example, an extra unit of distance added to a long movement is of less importance than an extra unit added to

a short movement (Carrothers, 1956).

Stouffer produced a complete variant on this theme by arguing for no deterministic relation between migration and geographical distance. Instead he proposed the hypothesis that "...the number of persons going a given distance is directly proportional to the number of opportunities at that distance and inversely proportional to the number of intervening opportunities." (Stouffer, 1940, p. 846). Stouffer's hypothesis was conceived in the framework of intra-urban moves but as he defined opportunities as proportional to the number of migrants to any tract, he introduced circularity into his argument which made the validity of his study questionable. Anderson (1955) found that the use of intervening opportunities gave no greater accuracy in predicting the number of migrants than a pure measure of distance.

Unfortunately, both approaches to modelling have severe limitations when applied to mobility within the city. In the use of equations, the reasons for poor correspondence at an intra-urban scale are best appreciated if the problems of using a pure distance function are examined. When using equations it is assumed that the base population is symmetrical. The majority of urban areas, however, have an asymmetrical distribution and consequently the opportunity to move a given distance is not a monotonically decreasing function. Secondly, the equations are assumed to apply to a basically homogeneous population which is not characteristic of urban areas. Moore noted that "The basic problem

of fitting a distance function to population movements within the city would appear to be the level of generality applied by the formulation." (Moore, 1966, p. 22). For while it is a relatively simple step to modify these general functions to include, say, differential residential density, it becomes very complex to attempt to introduce and allow for the different distributions of socio-economic groups. Consequently, the information for urban areas is normally of too specific a nature to be handled in this way.

The second type of approach also encounters difficulties in its application within urban areas for those formulae were designed for aggregate analysis and are less useful for individuals and small groups where idiosyncracies are not ironed out by the sheer volume of numbers. However, the gravity model still provides a useful tool to describe the empirical regularities found in all migrations.

The basic question posed by both these approaches is whether distance per se is a hindrance to migration or is rather a function of other factors such as the expense and difficulty of travelling, the wish to maintain contacts in area of origin and the fact that information on opportunities is easier to obtain for short distances (Willis, 1974). Gravity models are now more regarded as tools to give quick approximations of direction and magnitude, than as laws or theories. With the problems attached to the use of these models in intra-urban research, the gravity model and the distance decay function have been increasingly used in this

role to permit more sophisticated techniques such as Markov chain analysis, linear programming and simulation models to become operational.

However, the preoccupation with the role of distance in migration did not end with these two approaches. A new set of models to explain residential relocation in terms of accessibility to the city centre and workplace were developed (Carroll, 1952; Kain, 1962). The theory behind these models assumes that transport costs increase monotonically with distance from work, that residential space is not an inferior good and the household chooses its location and consumption of residential space by maximizing the utility obtainable for a given income. It is therefore proposed that a household which is relocating in urban space will choose its location depending on its desire for space consumption and its tolerable level of transportation costs involved in the journey to work.

This idea has been widely criticised in recent literature, especially in investigations of the survey type which have shown that access to work and indeed accessibility in general terms, plays a minor role in residential relocation at the urban scale. Stegman in particular questioned the pre-eminence of accessibility in the process of residential relocation and offered empirical evidence that neighbourhood considerations were more important to residential locations than accessibility to place of work (Stegman, 1969). These location rent models do illustrate the forces influencing the urban spatial structure and housing stock but they do

not describe the behaviour of the housing consumers who are constrained but not determined by the land market. One vital factor affecting these theories has been the great increase in car ownership which has released households from the need to be tied to workplace or the city centre (Daly, 1968). A force which has operated in the opposite direction has been urban renewal which has introduced real competitive bidding between householders in central areas.

Linear Regression

As the importance of mobility within urban areas was realized, a dissatisfaction with the level and degree of explanation afforded by mathematical functions and the inadequacy of location rent models, stimulated new analytical approaches. These more recent studies which have used sophisticated techniques in attempts to explain and describe migration have been almost as unsuccessful as their predecessors. The use of linear regression has been a very popular procedure particularly at a large areal scale. It has been used mainly at an ecological level with census data and other official material where it has been of particular importance because of the inability to cross classify which occurs in published statistics. Regression in this situation provides a way of testing which factors are associated with migration. There are, however, problems of normality, linearity and multi-collinearity in data when using regression as many of the variables which are used are related, such as age, education and income. When such

a variable is included in the regression analysis at an early stage it will greatly reduce the explanatory power of the other variables with which it is highly correlated.

One essential step in the development of these models is an a priori conceptualisation of the possible causal relationships existing in a particular movement system, the lack of which may lead to erroneous conclusions. The residuals from regression analysis are valuable in that they may produce a spatial pattern which enables the discovery of additional variables to be incorporated in the regression equation. Regression analysis is used in the present study to estimate the importance of estate size and distance to the level of interaction between estates.

Stochastic Processes

A stochastic process is one which develops in time according to probabilistic laws. This probabilistic process would appear to accord well with the nature of migration and both Markov chain analysis and simulation techniques have become widely used in migration research since the 1960s. However, a Markov chain requires a constant probability of transition between states. This means that any two elements occupying a common state at time (t-1) must have identical probabilities of moving to a specified state at time (t) regardless of prior histories. McGinnis has shown this to be unrealistic in terms of mobility for he argued that "...the probability of remaining in any state of nature increases as a strict monotonic

function of duration of prior residence in that state." (McGinnis, 1968, p. 716). This idea has been tested in several studies for example (Myers, McGinnis et al., 1967; Morrison, 1967; Land, 1969) and evidence from these has shown that as well as length of residence, age of individual is also important in determining the future probability of moving.

Even the dynamic stochastic model put forward by McGinnis does not accurately reflect the migration process, as it assumes that all moves involve the complete removal of ties with the place of origin. This is unrealistic as return moves account for a large proportion of all migration. However, the lack of suitable data has precluded much research into this aspect. Therefore as migration, in practice, is neither a regular nor a random process, Markov transition matrices do not give wholly accurate predictions but tend to under-estimate the within area movement (the elements on the diagonal).

Markov chains have been used quite widely nevertheless, in the analysis of population movement between physical states such as cities or administrative areas and also between social states (Compton, 1969; Brown and Longbrake, 1970). The mean first passage time has been used to indicate the number of steps required for a migrant to enter state (s_j) for the first time after the initial position in state (s_i). This gives some indication of the relative importance and the position of areas in the spatial pattern of migration and of migrant preference over time (Willis,

1974). This approach is used in Chapter 6 in the study of movement between council estates.

Simulation is another form of stochastic model which has been used in description and attempted prediction. Migration cannot be predicted with certainty but only in probabilistic terms. The simulation mode is especially relevant where there are no apparent predictor variables but where the form of the pattern is predictable. Both Hägerstrand (1957) and Clark (1970) have used Monte Carlo methods to give simulations which corresponded closely with reality.

Linear Programming

Linear programming has been used by Herbert and Stevens (1960) and Brown, Horton and Wittick (1970), the latter in intra-urban migration to distribute households to areas in an optimal configuration. The pattern of distribution in these studies depended on the migrant households' information levels about areas at different distances from their origins. Both studies encountered operational problems and the latter produced a high level of over-allocation of migrants to zones near their origins.

Factor Analysis

Factor analysis has been seen to be useful as a descriptive technique in migration analysis but it also has inherent difficulties. Factor analysis can measure the similarity of the flow patterns (it is used for this purpose

in the present study in Chapter 6) but as it is based on the correlation matrix of the variables, it ignores the total number of people involved, weighting large and small flows equally. Therefore the patterns which it reveals may not be the most important in terms of the volume of migrants. It is essential to check results against the data for it may also identify negative patterns based on a common distribution of zeros or low values. Factor analysis has seldom been used as the sole method or approach in any study but is generally used in conjunction with other types of analysis.

In general then, migration has proved to be too complex to be completely summarized by mathematical formulae or equations. This does not imply that interactions in large numbers cannot be described mathematically but it does mean that the threshold where the power of individual decision making critically affects the results, must be determined before the concepts can be broadly applied in practice (Carrothers, 1956). The relative failure of these approaches to explain the process of migration has led to the bulk of recent research being concentrated on investigations at the level of the individual.

II Ecological Approaches

Despite the realization of the importance of individual migrant behaviour, the fact that much of the data which is readily available for research is information on an aggregate level, such as census reports, has led to numerous ecological studies. The census information on which these studies are

frequently based has been greatly improved in recent years and the 1971 data which is available at enumeration district level is superior to all previous censuses. However, analysis on an ecological level restricts the conclusions from any study. Moore (1972) in part of his study of Brisbane used an ecological approach and found a very high degree of spatial autocorrelation in the variables he was using which produced problems in the conclusions which he could draw from his regression analysis. He found that many of the demographic and socio-economic variables which he was using to explain mobility had a similar spatial pattern to that of the mobility rates. This made it difficult to tell if the relationships which emerged from the regression analysis did anything more than confirm this spatial similarity. Especially, it was found that all the explanatory variables had a marked radial pattern and a high correlation with accessibility to the centre. This gave rise to the doubt that the relationships between mobility and the other variables may have been nothing more than an expression of this common relationship with access to the Central Business District.

Another major problem in ecological analysis lies in the definition of areal units. It is obvious that variations in rates of migration will occur as areas change in size, shape and internal population distribution. Work has been carried out to illustrate these effects but no unique solution is possible and each study must define the areas most suitable for its own purposes and realize the variations

which may occur (Kulldorf, 1955). However, a study in Newcastle by Willis (1972) found that the variation in size and form of areas had a limited effect on the variations of migration rates.

Even with detailed elaboration and the use of sophisticated multivariate techniques, ecological approaches are of limited value. Gans highlighted the limitations of ecological analysis in his statement that, "Ecological explanations of social life are most applicable if the subjects under study lack the ability to make choices, be they plants, animals or human beings. Thus if there is a housing shortage, people will live almost anywhere, and under extreme conditions of no choice, as in a disaster, married and single, old and young, middle and working class, stable and transient, will be found side by side in whatever accommodations are available." (quoted in Murie, 1974, p. 113). Migration, even in the public housing sector, is characterized by the individual, or more often the household, making choices. Ecological approaches generally focus insufficient attention on the processes, determinants and institutions involved in organizing the urban system (Murie, 1974). Above all, care must be taken to remember Robinson's 'ecological fallacy' in such studies (Robinson, 1950).

Data restrictions have been the major factor in an overwhelming reliance on such aggregate analysis and while data collection continues to be normally beyond the resources of research workers or teams the necessity to use published sources will remain (Welch, 1971). Many recent studies

appear to have overcome this problem by initiating small scale survey investigations to provide the necessary data at an individual migrant level.

III) Behavioural Approaches

The increasing awareness that the greatest potential for understanding migration lies with investigations at the level of the individual, has produced an upsurge in attention to the migrant's own definition of the situation and account of his own motives. The behavioural approach is no less fraught with difficulties than the others. One basic problem arises from the inability to discern the difference between 'real' and 'stated' motives. Any retrospective survey will involve this complication, for the migrant does not recount the events leading to the decision to migrate *a priori* but rather his evaluation of the event *a posteriori*. Once a person has moved he has information about the consequences of that move which will colour his recollection of the original decision to move. (The data in the present study do give *a priori* information).

This approach is more concerned with the migration process *per se* than with population distribution or its effects. Behaviouralists have however been more successful in conceptualizing and hypothesizing than actually making their theories operational and testing them. The migration process at this individual household level was modelled by Brown and Moore (1970) and is seen as being split into two sequential but separate steps which are not irreversible, viz.:

a) the decision to move, and

b) the relocation decision which includes the search for and evaluation of a new residence.

a) The Decision to Move

If we can generalize that the basis for all migration lies in a dissatisfaction with the contemporary environment, it can be seen that a multitude of factors will influence the decision of the individual or household to move or not to move. Timms has stated that "...before any decision to locate in a particular area has been taken some threshold of stress must have been passed in connection with the previous residence." (Timms, 1971, p. 51). Stress leading to a decision to move can be seen to arise from several basic sets of factors.

1) The household's position in the life cycle will affect its space needs and other housing requirements.

2) The household's life style and its existing form of housing will affect its attitude towards mobility.

3) The residential environment including both physical and social neighbourhood characteristics may stimulate mobility.[3]

1) Life Cycle Influences

By far the most important factors in promoting a decision to move are those grouped under 'family life cycle' influences. Rossi, in the first major study to be conducted at the level of the individual decision maker concluded that "...mobility is the process by which families adjust their housing to the

3 These influences are fully discussed as an integral part of Chapter 8 when the reasons given for moving are investigated. They will be discussed briefly here to illustrate the development of the behavioural approach to migration research.

housing needs that are generated by the shifts in family composition accompanying life cycle changes." (Rossi, 1955, p. 9).

Although recent work has pointed out dubious aspects of Rossi's analysis (Morgan, 1973), this study was important as it laid the foundation for subsequent studies of a behavioural approach. These later studies have substantially supported the importance of stage in the life cycle as an important influence on mobility. They argue that life cycle changes act through the intervening variable of dissatisfaction with the present dwelling to stimulate mobility (Speare, 1974; Ladinsky, 1967). This argument is slightly contrary to Rossi's initial proposals where he constructed a 'Complaints Index' as an independent influence on mobility. The mechanism now thought to be at work is one whereby, as families pass through the typical life cycle, pressures arise on the internal space of the dwelling as the number and age of children increases. It may not be the actual shortage of space which causes the decision to move but the subjective evaluation of that space.

Age of household head must also be seen as an important influence on mobility, apart from its effect through life cycle stage. Persons of the same life cycle stage but of different ages have different tendencies to mobility with younger household heads being more mobile. Age of children too was found to be an important indicator for movers and non-movers (Coupe, 1974; Long, 1972). These independent

influences must temper the importance of life cycle factors.

2) The Influence of the Household's Life-Style and Housing Type

Variations in the patterns of housing use by those at similar stages of the life cycle may be attributed to differences in life-style. These are most frequently illustrated by tenure differences and location and as such are of less relevance in the public housing sector.

Bell (1958) recognised three types of life-style which he felt were capable of motivating movement decisions. Firstly, there were those households which held aspirations related to consumption and which laid emphasis on enjoying the material benefits of a modern urban society. Locationally, this type of life-style was likely to lead to a move from the suburbs to a central city apartment and was most likely to be made by single persons, by young couples with no children and by older couples whose families had left home.

Secondly, there were those households which held aspirations oriented towards a family life. They stressed the importance of the provision of the 'right type of environment' for children and maximum space and facilities were sought by a move to the suburbs. This was typical of young middle class families.

Thirdly, households which held aspirations based on social prestige were likely to move to the elite suburban areas in an attempt to have a life-style appropriate to the head of the household's job and position in the community.

Moore (1972) added a fourth category to this list, of those who held aspirations to live in communities such as hippy colonies or religious groups. This involved mainly young single persons but is only a very minor influence in stimulating mobility in the population at large.

It is unlikely that any of these life-style variations have much relevance in stimulating mobility into or within the public housing sector in Britain. The uniformity of housing in this sector which was built with the objective of providing family homes, is likely to effectively exclude almost all but those who aspire to the second form of life-style.

Type of housing interacts with both life-style and position in the family life-cycle to influence mobility. As households progress through the typical life cycle, their life-style changes also. When a young couple are first married with no children, a flat, even in a multi-storey, may be an ideal home. When they have become a family with growing children it is likely that they would prefer a 'cottage type' house with a garden. Still later, when the family have grown and left home and perhaps one or both partners have retired or suffered a deterioration in health, the once ideal cottage with a garden may become a burden. At this stage a small flat or even sheltered accommodation would be more suitable. Therefore it is likely that a disparity in housing type and housing desires will create a degree of stress which in turn may lead to a desire to move.

3) The Influence of Residential Environment including the Social and Physical Characteristics of the Neighbourhood.

It is generally assumed that the population in any urban area is to some extent segregated in terms of socio-economic status, life-style preferences and ethnicity, thus mobility between areas may be viewed as a reaction to environmental stress caused by disharmony between the individuals and the area in which they live. Residential relocation may then be seen as a strategy to minimize the social distance between the individual (or household) and the people with which he wishes to associate and to maximize the social distance from those he wishes to ignore. Residential mobility tends towards an equilibrium in matching individuals to neighbourhoods. Social mobility associated with career pattern is often a corollary of physical mobility, however, such influences tend to be generally of minor importance, particularly perhaps in a study such as the present where socio-economic status, life-style and ethnicity are to a large extent uniform.

Differences in physical environment are however also likely to be important in stimulating mobility. For all types of mobility, movement rates are highest where dwellings are of a marginal quality compared with the norm of the type (Clark, 1970). Therefore vacancies tend to occur most often in areas of lower quality. However migrants who choose these areas may still be improving their residential situation. Arterial sites, corner plots, cul-de-sacs and other adverse site features also seem to stimulate higher mobility (Boyce, 1969).

Given all factors favourable to initiating mobility a move is not always guaranteed. Substantial inertia must be overcome. This may arise from tenure factors, long term residence in a dwelling and a high level of social interaction in an area and particularly from institutional constraints.

Factors Creating Inertia

1) Tenure

Many studies have shown a substantially greater level of movement for renters than for owners. Donnison (1961) found that tenure had an important bearing on the satisfaction people gained from their housing and that it played an important role in their choice of alternatives. For owner-occupiers the ties with dwellings appear to be sufficiently strong to overcome the pressures of changes in the life cycle, although adjustment *in situ* is more feasible for this group. Mobility rates for owner-occupiers tend to remain at a low level irrespective of duration of residence. For renters, ties with dwellings appear to be less strong and as Local Authority tenants in particular incur no legal and lower capital costs when moving, the process of mobility would appear to be simplified for this group.

2) Duration of Residence

Length of time lived in a dwelling appears to influence the mobility level for renters. As duration of residence increases, the probability of making a move in the next

time period becomes less. As time progresses the habits of the household become more strongly established and there is a growing reluctance to initiate a fresh pattern of daily life elsewhere. Several studies have shown this to be an important influence for renters (Myers et al., 1967; Morrison, 1967; Land, 1969). Studies of home owners have shown much less agreement with this idea (Speare, 1970).

3) Social Integration

Social integration in a local community is likely to increase with the length of time lived there and may have a negative effect on the desire to move. In any analysis of the role of such factors the qualitative nature of the interaction is of more relevance than the mere existence of linkages (Moore, 1972).

4) Institutional Constraints

The most important constraints on movement, however, are institutional ones. In the housing context, building societies and estate agents in the private sector and local authorities in the public sector have the power to allocate resources and to control and constrain the household's housing opportunities (Gray, 1976). The nature of the housing supply within a city influences the behavioural patterns of mobile households (Short, 1978). It is the supply and allocation at any point in time which determines the pattern of mobility in any city. For

example, new house building on the periphery may produce strong spatial biases such as those seen in the movement to Wester Hailes in Edinburgh in the early 1970s. As these new residential units are usually taken up by pre-existing households this produces a continuous and complex pattern of intra-urban migration (Johnston, 1969). Often new housing will attract families at a very mobile stage and essentially freeze them in that dwelling with the probability of out movement being sharply reduced (Simmons, 1974). Therefore it is often the characteristics of those households which are mobile when new housing is first occupied which determines the social character of areas in the city (Morgan, 1976).

The structure of institutions does not inevitably remove alternatives although certain groups are clearly excluded from or trapped in specific parts of the system. Housing opportunities are regrettably not equal for all households with the same requirements and the adjustment of housing circumstances depends on the capacity to qualify in the terms operated by those involved in housing management. Owner-occupiers must qualify for mortgages or loans, renters must be financially able to pay the requested rents, while those in the public housing sector must further qualify for a tenancy in terms of 'need' as defined by the Local Authority.

Recent research into the role of urban managers and gatekeepers has emphasised the inequalities which exist in housing allocations and has highlighted the need to account

for this control in any explanation of the pattern and process of intra-urban mobility (Gray, 1976; Niner, 1975; Byrne, 1976; English, 1976; Murie, 1974). In the public housing sector controls act at two levels. Initially they determine who is eligible for a tenancy and secondly they determine applicants' suitability for a particular type of housing and/or a particular area. This is discussed at greater length in Chapters 6 and 8.

In the light of these findings it would seem vital to attempt to combine the aspects of demand and supply in any study of intra-urban mobility. It is hoped that by examining the process of mobility at work within the public housing system that it will be possible to illustrate the effects of some of these institutional constraints.

b) The Relocation Decision: The Search for and Selection of a New Residence

The second stage in the process of mobility, after the decision to move has been made, is the search for and selection of a new residence. Before the individual (or household) can transform his desire to move into reality a satisfactory alternative dwelling must be found. There is ample evidence to suggest that movers look for a satisfactory rather than an optimal dwelling (Donnison, 1961). As the amount of space and the general characteristics of the dwelling closely correspond to the cost, the dwelling chosen is frequently not ideal. More often it is the one within the household's price range which minimizes

complaints (Morgan, 1973). In the public sector the characteristics of the dwelling and the environment do not necessarily reflect the preferences of the household as choice is limited by the allocation system. A Ministry of Housing and Local Government report (Cullingworth report, HMSO, 1969) concluded that "...dwellings are often allocated to tenants in a manner that is more determined by what the authority thinks the tenant needs and deserves in relation to the stock of dwellings available, than by what the tenant states he desires." (quoted in Bird, 1976, p. 20).

Despite these additional constraints both owner-occupiers and renters must define the areas of the city in which they wish to relocate and the characteristics which they desire in a new home. Owner-occupiers generally have to make a personal search for suitable vacancies and while prospective council tenants will have vacancies presented to them by the local authority, they too will necessarily have to select the most satisfactory alternative.

Brown and Moore (1970) in their model, describe this process of the search and selection of a new residence as falling into three broad areas. Firstly, the household must decide on the criteria which it will use to evaluate any possible alternatives. It is likely that these criteria will reflect the motivations behind the decision to seek a new residence. For example, if lack of space has been the principal factor in stimulating the desire to move then only dwellings which are larger than the present

one will be considered. Similarly, neighbourhood quality and the availability of amenities are likely to be considered important if dissatisfaction with the present residential area was the main reason for deciding to move.

Secondly, the household must make the actual search for possible alternatives. The search for and evaluation of a new residence is widely described in the literature (e.g. Wolpert, 1965; Horton and Reynolds, 1971; Clark, 1970; Moore, 1972) however, this has limited relevance when dealing with the public housing sector as the set of alternatives is clearly defined by the Local Authority Housing Department. Nevertheless the proposed procedure will be discussed briefly here as the idea that the choice of a new residence will depend on 'what and how much' the household knows about the urban area is undoubtedly important even in the public sector.

The efficiency of the search procedure is vital for vacancies must be found before they can be evaluated. Wolpert noted that "... the order in which the environment is searched determines to a substantial extent the decisions which will be made." (Wolpert, 1965, p. 165). Although the individual theoretically has access to a large range of local, regional, national and international information, coverage is usually of a limited portion of that environment. An individual's wider field of information is termed the action space (in this case limited to Edinburgh city), while the narrower local region with which he has frequent contact is the activity space

(undefined - but a subset of action space). The remainder comprises the indirect contact space about which the individual has learned through the media or personal contacts. From these sets of areas the individual or the household will define an aspiration region or search space (areas of choice) which will contain the dwellings seen as potential homes. The probability of finding a new residence then depends on the set of vacancies which exists within this aspiration region, the characteristics of these vacancies and the institutional constraints on them.

Although there appears to be general agreement about how activity spaces are formed, no such agreement exists as to their spatial form. The predominant argument has been for a wedge-shaped mental map focused on the C.B.D. which consequently introduces a sectoral bias into the intra-urban migration process. This idea was first put forward by Adams (1969) and has been widely tested and supported by subsequent studies (Clark, 1972; Johnston, 1972; Donaldson, 1973; Donaldson and Johnston, 1973). Whitelaw and Robinson (1972) suggested that a more general 'commuter axis' would be of more relevance to the formation of activity spaces as the decentralization of many work-places in the city meant that travel to the C.B.D. was now not always the most frequently made journey. Both these forms of sectoral bias are tested along with distance and directional bias for the movement of new tenants into the Local Authority sector in Chapter 4.

During the search procedure, households use various

sources of information to seek out possible alternative dwellings. These sources vary in both their range and effectiveness. Mass media, specialized agencies, display boards and social contacts are all used, with mass media the least effective and personal contacts the most efficient. Households which have similar aspirations and preferences may differ in housing behaviour because of variations in knowledge. The search for information is likely to be influenced by previous experience, existing perception and awareness.

Not only do sources of information vary in their effectiveness but they are also often selective with regard to the type of households who use them. For example, informal information sources are more frequently used in lower status areas than in others. Real estate agents tend to have a specific range of property and be socio-economically selective. The distance of prospective migrants from the source of information may also be important, for the probability of information being available about a given vacancy decreases with increased distance from the source (which may or may not be the same as the vacancy location). Biases are therefore introduced into households' contacts and perceptions of vacancies and these biases are undoubtedly translated into the patterns of migrations.

The role of time is also vital, for as time passes, the household may have an increase in the volume of its action space and a consequent realignment of its search

space. However, as the time remaining in which to find a suitable alternative decreases, the household is subjected to increasing stress. This results in evaluation being impaired, hasty decisions being made and a fixation on specific areas and information channels which are perceived as having the greatest probability of giving a result. Thus the relationship between action space and search space is time dependent. Also as time progresses and no success is achieved the household may again consider alternatives to relocation.

The process of searching for and the selection of a new dwelling can be summarized briefly as follows.

Stage 1) The household defines the criteria which it will use to judge possible alternative residences.

Stage 2) The household then defines the areas in the city in which it would prefer to relocate. These are normally areas with which household members are familiar through contacts over time by travel to work or by other means.

Stage 3) The household uses various sources of information about which it has knowledge, to provide details of vacancies within the areas chosen.

Stage 4) The household selects the most satisfactory dwelling within its price range or returns to Stage 1 to reconsider its alternatives.

Obviously for households in the public sector Stages 3 and 4 are modified. The Local Authority Housing Department will be the major source of information about vacancies

although informal contacts may give details of where vacancies are going to occur in the near future. Those who are wishing to exchange council houses also frequently advertise in local newspapers and shop windows. The final selection for those in the public housing system will not be a matter of choosing between alternatives but rather to decide whether to accept or reject the offer of one particular dwelling.

For both owner occupiers and renters it is possible that the most satisfactory alternative dwelling will not match up to all the expectations which the household defined in Stage 1. In this case it may well be necessary for households to trade off certain stipulations for others which are more important. In most cases then, when an alternative is finally found it is more than likely that it will be less than the optimal which the household had hoped for.

Involuntary Moves

The behavioural model as described above considers only one alternative of the process of mobility i.e. that stress occurs and stimulates the desire to move which is followed by the search for and selection of a new dwelling. However, in reality, alternative processes may occur. The household may find suitable alternative accommodation which is so attractive that it stimulates the desire to move. Similarly, the household may be offered a better dwelling by an employer or friend and therefore decide to

move without even making a search for alternative accommodation (Popp, 1976).

The most important deviation from the model however must be those households who are forced to move. Such households have no desire to move but external events force the decision upon them. These forced moves constitute a high proportion of the total moves made within any urban area. Rossi found that one in four of the moves made in his study were involuntary and other studies in both the U.S.A. and Britain have found forced moves in proportions ranging from 9% to over 20% (McCarthy, 1976; Watson, 1973; Clark, 1970; Popp, 1976; Short, 1978). The problem is not only widespread but it is particularly associated with moves into the public sector where figures of up to 35% of all moves being forced moves have been found (Murie, 1974). The pattern and the process of mobility as it applies to these forced moves has been rather neglected but it is hoped to amend this to some extent in the present study.

Summary of Approaches to Migration and their Relevance to the Present Study

Three basic approaches have characterized migration studies to present, the mathematical approach, the ecological approach and the behavioural approach. The earliest studies were attempts to develop strict laws and theories and have tended to fall into some degree of disrepute, although their usefulness as purely descriptive

measures cannot be denied. The early over-riding preoccupation with a mathematical approach arose from a desire to obtain the clarity, explicitness and freedom from contradiction which mathematics alone can lend to a theory. These studies were mainly at a regional level and the role of distance was seen as vital in the majority. Many drew on analogies from the physical sciences and this led to the development of the 'gravity model'.

When these approaches were applied to mobility at an urban scale they were found to be very inadequate to describe or explain the patterns at this micro-level. The role of distance remained prominent in the 'location rent' approaches to residential relocation, but these too have been discredited by recent studies which have shown access factors to have a minor role in residential relocation at an urban scale.

With the improvement of census data, ecological approaches using aggregate data became more important. However, even with the use of sophisticated mathematical techniques such as linear regression, Markov chain analysis, linear programming and simulation models, aggregate data could not begin to explain the process of migration at a micro-scale.

As the interest in intra-urban mobility grew, it was realized that studies at the individual migrant, or household level were the most rewarding way in which to investigate the process of mobility. This led to a large number of studies on a conceptual level and the modelling

of the process of mobility. There have also been many empirical studies at this level in recent years and these have formed an important background for the present study.

Even more recently, the increased awareness of the role of institutional constraints in migration has produced a flurry of studies which have turned away from the demand aspect and concentrated on the problems of the supply and allocation of dwellings to potential migrants. These studies of the role of urban managers and gatekeepers, have been vital in highlighting the inequalities which exist in some parts of the housing system and the effect of this on the process of mobility. They have shown that the study of households' decisions to move cannot be seen in isolation from the controls imposed upon them.

Methodology and Approach to Present Study

The approach to the present study is of an inductive nature, for little information is available on which deductive reasoning can be based. Although a deductive approach is usually considered to be the more useful in research "... the difficulty with deductive systems of explanation is that deduction by itself cannot prove anything which we do not already know." (Harvey, 1969, p.37). Consequently, where a research field is characterized by a lack of basic information an inductive approach is necessary to enable the researcher to formulate theories of maximum plausibility which then may be subjected to

deductive reasoning. Thus researchers of migration have been forced initially to be describers and collectors of data. However, geographers (hopefully) do not "... go out into the world with empty heads", (Bunge, 1962, p.3) but have vaguely formed implicit and perhaps even subconscious 'theories' which allow the development of more explicit theory from these descriptions. The argument for the existence or non-existence of a scientific basis for inductive reasoning is not one to be investigated here, as we are in any case involved with a cyclic process in which neither induction nor deduction exists nor can exist in isolation from one another.

The present study incorporates aspects of all three of the methodological approaches which have been summarized above. This is possible for in no way were the categories meant to be mutually exclusive and indeed the ecological approach has always relied heavily on the multivariate te chniques outlined in the first group. Those approaches or methods of analysis which seemed to be the most convenient and effective were chosen in each part of the study because they appeared to be the most efficient for the purpose, rather than because of any underlying philosophy. Harvey (1969) argued that this separation between methodology and philosophy provided maximum flexibility in tackling any problem for every method was then available for use, provided that it was shown to be reasonable for the intended task.

The basic approach is however a behavioural one as the

prime focus is on the process of mobility, as it works within the public housing sector, and the information is at an individual level. Several of the multivariate techniques which were outlined above are used in this study. Regression analysis is used in a gravity type model to estimate the importance of size of estate and distance in explaining the degree of interaction between estates. Markov chain analysis is used to judge the relative positions of areas in the migration field during the period of study. It was also used to estimate the distributions which would result were the same patterns of movement to continue through time and the different patterns which would be found if stated areas of choice were realized. Factor analysis (principal component analysis) is used in two roles in the study. Firstly, a component analysis is used to form the basis of a description of the social structure of the city. This produces a typology of areas which is used as a background for the movement of new tenants into Local Authority housing. Secondly, component analysis is used to summarize the flow patterns of movement between estates.

In the descriptions of the patterns of movement into, between and within estates use is made of aggregated information from origin-destination matrices. The movement of new tenants is analysed in terms of the movement between social areas in the city and in relation to distance, directional and sectoral biases from their origins.

The behavioural part of the study involves descriptions of the characteristics of movers and non-movers and takes into account the effect of inertial factors, although tenure is of course constant in the present context. The decision to move and the influence of stage of the life cycle, age of household head, housing type and environment are all investigated within the framework of an analysis of the reasons given for moving.

Although the search for and evaluation of a new residence is not relevant as described above for those in the public housing sector, the choice of estates is of importance. The rating of estates in terms of their popularity and their housing, social and physical characteristics are examined as these features all affect the movement of tenants. The influence of institutional constraints and the working of the allocation system are also investigated. Involuntary movers are discussed, particularly in relation to the characteristics of the households involved, where they are rehoused and the factors which force them to move.

The present study then, makes use of many of the approaches described above to investigate the patterns and process of mobility in the public housing sector in Edinburgh. However, the aim of the study was less to replicate the methods or objectives of other studies but rather to use the information gained from them to permit as full a study as possible in the present context. Obviously, data limitations were a problem and ultimately

the study could only be as complete as the available data would allow.

Description of the Data

The basic data set consists of a 10% systematic sample of the 'records of let' for the City of Edinburgh for the period 1963-1973. The 'record of let' is a file of information for each dwelling which is let by Edinburgh Corporation Housing Department, dating from the time when it was first occupied. The inconsistency through time of these records would however not allow a 'chain type' of analysis. The sample taken was therefore of dwellings but the details of mobility were of the present tenant of each selected dwelling and it was that household's migration history which was recorded rather than the history of tenants who had lived in that house.

The collection of information from these files was limited by the strict necessity of confidentiality and the sheer numbers involved. Also, as these files were in daily use by the staff of the Housing Department, care had to be taken to keep to a minimum the amount of time involved in extracting information. The fact that the Housing Department moved physically and modernised their filing system during the period of data collection gave added problems.

As these files were arranged in alphabetical order by street names the most satisfactory method of collection was to extract every tenth file for examination. Using this

method it was found that the cut off date of 31st December 1973 was impracticable. As these records were being constantly updated it was necessary to include in most areas a small percentage of households who had moved between 1st January 1974 and the end of June 1974, by which time the sampling was completed. This small number of movers, under 10% of all households in any estate, was incorporated into the study to keep sample numbers as high as possible. As the sampling was carried out by street name, no estate would have an unfair advantage to acquire a greater proportion of 1974 movers than any other.

The completed sample gave a total of 5,027 records successfully consulted and only 17 files were unavailable for consultation. This figure excludes miscellaneous properties such as single dwellings owned by the Corporation throughout the city and tied properties for teachers, police and other special workers for which details were limited. Cost rent properties mainly in the Royal Mile, Swanston Village and Cramond were also excluded because of their special nature which may have introduced peculiarities into any analysis of the council housing stock in general. Those properties owned by the Scottish Special Housing Association but let by the Authority had also to be excluded due to lack of information on previous addresses of tenants. All these groups form only a small proportion of the total Local Authority housing stock in the city, accounting for about 1,800 out

of a total of over 55,000 council houses in Edinburgh. In the records which were consulted, some households had moved more than once during the period of study, therefore the number of recorded moves totalled 3,443 and this together with 2,146 non-movers gave a total of 5,589 cases for study.

The 'record of let' gives details of movement into the council sector, transfers and exchanges between areas of council housing in the city and moves within estates. It also records moves into the public sector from outside Edinburgh (limited by residence qualifications) but cannot tell anything about movement out of the council sector. These records also give past and present addresses, a wide range of socio-economic and demographic information and the reasons given for moving at each application for a new tenancy or a transfer. For each household a profile of facts was extracted from the record, each time a change of residence occurred. For those who did not move during the period of study this meant that the information was gained at the time of the move into their present dwelling and therefore might have borne no resemblance to that household's circumstances at the time of the survey. Taking this into consideration, only one chapter involves an analysis of this group and the remainder of the thesis concentrates on the movers for whom information was more recent.

Of the facts which were recorded for each household, some were of more relevance than others (Table 2.1 shows the selected variables). For example, rent and income

proved to be unusable in comparisons because of the ravages of inflation over the study period. This meant, for exmaple, that a standard rent of £47 around 1959 had increased to £136.50 by 1974 and without detailed information on rent increases and rebates no comparisons could be made. Similarly, incomes rose substantially during the period and both these economic indicators were omitted from any analysis.

A total of eighteen facts and the composite variable of stage in the life cycle were coded and punched on cards to permit computer analysis. Unfortunately, it was not possible to code past and present addresses or place of employment in this way and they had to be dealt with manually. To permit an analysis of the patterns of movement an origin-destination matrix had to be constructed by searching every case for past addresses as the sample was grouped by area of present residence. Thirty council estates were distinguished by grouping contiguous areas from the housing districts used by the Housing Department and allocating to them a general areal name. Detailed maps of these estates can be seen in Chapters 5 and 6.

The information collected was limited by the amount available on each tenant's application form and not all permitted a full profile to be recorded. This meant that there was frequently a variation in the number of cases supplying information on different household characteristics but with such a large sample this posed little problem.

Additional information for the study was collected from

two sources. Firstly, the Housing Department also kindly permitted the collection of data from their records on the numbers, types and sizes of dwellings in estates and the date of their completion. Details of clearance schemes, letting regulations, points and allocations systems and numerous facts about the working of the housing system were also collected from official records and by formal and informal interviews with staff.

Table 2.1 Information Extracted from Records of Let

Past Address
Present Address
Date of Entry to Past Address
Date of Entry to Present Address
Number of Apartments at Past Address
Number of Apartments at Present Address
Type of Tenure at Past Address
Rent at Past and Present Address
Type of Employment at time of application - coded as socio-economic group
Income
Age of Household Head
Sex of Household Head
Civil Status of Household Head i.e. Single, Married, Widowed or Divorced
Number of Persons in the Household
Ages of Dependants
Reasons for Moving
Type of Move i.e. Transfer, Exchange or Rehousing
Local Authority Estate moved into
Place of Employment

Additional coding into Mover or Non-Mover and by Life Cycle Stage as defined in Chapter 8.

Secondly, the 1971 census was used as a source of background information, particularly for use in the construction of a typology of areas in the city. This information from the census is used in the next chapter to provide a description of the social structure of Edinburgh and subsequently to produce a typology of areas to aid in the examination of the movement of new tenants into the council housing sector.

CHAPTER 3

THE SOCIAL STRUCTURE OF EDINBURGH

Introduction

In any investigation into the movement of households within a city it is important to investigate the social structure within which those moves occur. In large cities an immensely complicated structure has developed, a constantly changing but delicately balanced areal organization composed of many highly specilaized districts with complex linkages, the product of a variety of forces operating over long time periods (Nelson, 1969). The examination of Edinburgh's social structure from the 1971 census data then will provide important background information for the ensuing study. There are several methods by which the social structure could be investigated and also various hypotheses as to what form that structure might take. It is perhaps most suitable to look briefly at these alternatives before explaining the actual method adopted in this instance. A summary of the alternatives should serve as sufficient in this context since detailed elaboration would merely be repetition of well-known literature (Bourne, 1971; Davies and Lewis, 1973; Herbert, 1967; Murdie, 1969; Robson, 1969).

Alternative Constructs of Social Structure

There are three classical descriptive models of urban structure. The first of these was put forward by Burgess

(1925) in the Chicago school of urban sociology. His descriptive model was based on the idea that the development of a city takes place outwards from its central area to form a series of concentric zones. The model was taken directly from biological analogies and based on the ecological principles of competition, dominance, invasion and succession and the idea of a natural/functional area of a group. It was argued that socio-economic status would then vary directly with distance from the city centre, for this model is the spatial equivalent of the filtering process.

The sector theory put forward by Homer Hoyt (1939) is the second of these models. Hoyt's idea of sectoral growth was advanced as a refinement of Burgess' concentric zone theory. The basic thesis was that once contrasts in land use had arisen near the centre of the city, these differences would be perpetuated as the city expanded. Distinct sectors of land use were most likely to grow out from the centre focused on major roads. This theory was primarily conceived as an explantion of high class residential development. The idea is that once an area of high class housing exists, the most expensive sites for new housing will lie along the outer edge of this area. Such districts will then tend to be localized on one side of the city rather than in a concentric zone, and will expand out in a sectoral fashion.

These two early theories have an attractive simplicity which still holds good in general terms today. However,

present day cities are much more complex than either theory would allow. Harris and Ullman (1945) put forward a more flexible theory of urban structure in which distinctive types of land use develop around certain nuclei within the urban area. They suggested that this was caused by four factors, viz.:

1) certain activities require specialized facilities,
2) other activities group together because they profit from cohesion and clustering,
3) activities which are detrimental to one another are not normally found close together, and
4) many activities are unable to afford the high rents of the most desirable sites.

Peculiarities of topography and the historical development of an individual settlement are treated as important factors in this theory, but this cannot provide a simple model which may easily be applied to any city and must be regarded more as a guide to thought about the structure of a city than as a strict generalization of form.

These theories have declined in relevance with the major changes which have occurred in modern cities. The models put forward by Burgess and Hoyt predate the major impact of the automobile, post-war booms in population, housing construction, shopping facilities and in social and industrial mobility. These changes plus the effects of changes in attitudes and in political and institutional organizations have altered both the basic assumptions and the expected outcomes of these classic models resulting in

need for new analytical formulations. (Bourne, 1971).

Considerable debate has taken place about the relative merits of these models but the results of numerous factor analysis studies in recent years led Berry (1965) to conclude that the three models were independent and additive contributors to the total socio-economic structuring of city neighbourhoods. The three dimensions of variation which are evident from these factor analysis studies are an axial variation of neighbourhoods by socio-economoc rank, a concentric variation by family structure and localized ethnic areas.

In Britain these patterns are frequently disrupted by the construction of local authority housing estates. Public housing can be developed on the outer edge of a high class sector, such as in the Clermiston and Oxgangs areas of Edinburgh. It may also have a central location as at Dumbiedykes. Both situations disrupt the ideas of zones and sectors and may mean that socio-economic status will not necessarily increase with distance from the city centre. New socio-economic combinations are introduced with lower social class families in the local authority estates now living in relatively good housing conditions. Urban renewal and clearance by the local authorities have also removed many of the poor inner city housing areas and in some cases replaced them with areas of middle class and elite housing.

The descriptive models of Burgess and Hoyt described above are more concerned with the social characteristics

of the population than with overall land use in the city or the processes by which the structure evolves. Those studies which have placed greater emphasis on the process of the development of urban structure have taken two main approaches (Bourne, 1971). Firstly there are those which see the structure of the city as resulting from the role of the market mechanism and the natural forces of competition among economic activities and social groups in an urban area. These theories are based on the logic of Von Thünen and hinge on the concept of 'land rent' where activities which can afford to locate near the city centre and which are capable of operating at higher densities force other uses increasingly towards the periphery of the city. This produces a sorting of land uses into concentric zones. In dealing with residential land uses Alonso (1960) proposes that the paradox which exists of the poor living on expensive land near the centre of the city while the rich live on cheaper land at the periphery can best be explained by the higher income households using their superior purchasing power to buy lower density housing at the cost of a longer journey to work. In the Burgess model the rich live on the periphery because that is where the new housing is available. In Alonso's model it is the lower density rather than the newness which makes the suburbs attractive to the wealthy. "Accessibility which diminishes with increasing distance behaves as an 'inferior good' i.e. although accessibility is desirable, people as they become wealthier will buy less

of it because they prefer to substitute it for something else (land)." (Alonso, 1964, p. 229).

The limiting assumptions necessary in the formulation of these economic models have nevertheless been severely criticized for what they overlook. Man is not entirely an economically rational animal with a single set of market criteria and with complete information at his disposal. Rather his decisions reflect individual preferences, objectives, ignorance and errors which all lead to increased complexities. Patterns of urban land use and activities derive from processes in addition to those of classical economics. Public policy and individual and corporate decisions of location are also important. It is with this aspect that the second strand of studies related to process are concerned.

In this group of studies the behaviour of urban residents and decision making by individuals, corporations and institutions are seen to influence the form of the city. Form (1954) recognized four components of organizational power and influence in the city namely, real estate interests, big business, residents and government. Each group was seen to vary in terms of its resources, motivations, formality and function and consequently in the strength and direction of its influence in land use decisions. The present study with its objective of investigating part of the process of intra-urban mobility in Edinburgh is a good example of this type of approach although it does not specifically attempt to examine the role of the process of intra-urban

mobility in the formation of the social structure of the city. Therefore although this study is concerned with one of the most important processes influencing the structure of the city, at present a descriptive framework which will allow the delimitation of similar socio-economic areas in Edinburgh is what is being sought.

With the general inadequacies of the earlier descriptive models, the analysis of urban structure has become an area of geography where multivariate techniques have become widely used, as indicated above (Berry, 1965). The data required for such analysis of British cities have been available since 1961 with the publication of enumeration district information from the census.

Multivariate Analysis

The first attempt at such an analysis was made by Shevky and Williams in Los Angeles (1949) and Shevky and Bell in San Francisco (1955) using the technique of Social Area Analysis. This has been widely criticized since, because of its use of three indices which were predetermined and based on the theory of urbanization of Louis Wirth (1938) which has dubious validity (Table 3.1).

Table 3.1 Composition of Indices Used in Social Area Analysis

Index	Social Rank (Shevky)	Economic Status (Bell)
Census Variables	a) % of manual workers b) % of persons with little formal education c) rent per capita	

Index/

Table 3.1 (Contd.)

Index	Urbanization (Shevky)	Family Status (Bell)
Census Variables	a) number of children under five years of age as a percentage of women aged between fifteen and forty-four years	
	b) % of women in the labour force	
	c) % of single family detached houses	

Index	Segregation (Shevky)	Ethnic Status (Bell)
Census Variable	The number of persons in a given minority group in relation to the respective percentage in the total population	

Source: (Rees, 1970, p. 315, Table 10.1)

Each census tract was rated on each index and social areas were mapped from like scores. The most frequent and important criticism of this method is that the choice of variables is purely subjective and at best based on a dubious theory of the forces of urbanization. However recent studies in the U.S.A. and elsewhere using the more objective methods of component and factor analysis have tended to confirm that the constructs of Social Area Analysis are indeed powerful discriminating variables. Generally, however, it is felt that component and factor analysis which use initially anything from thirty to forty variables are more sound. In these methods although the original choice of variables is subjective the components (indices) are determined statistically. It is perhaps doubly important to introduce a wide range of variables in studies in Britain, for many recent studies have shown the lack of comparability between cities here and in North America (Herbert, 1967; Robson, 1969).

Component Analysis

This approach attempts to achieve objectively and statistically what Social Area Analysis does deductively (Herbert, 1967a). Principal Components Analysis (a particular type of factor analysis) is essentially a means of reducing a large amount of data into a smaller and more manageable number of components derived from the original variables (Robson, 1968). It thus presents an almost ideal tool for investigating the structure of a city. The fact that component analysis is characterized by (a) parsimonious description and (b) the ability to identify the underlying structure which generates the pattern of statistical relations between variables, makes it invaluable in such an analysis (Moore, n.d.).

It is necessary, however, to realize that there are several important problems which affect any type of factor analysis and the consequences of these must be borne in mind throughout the study. Firstly, the use of 'ecological' correlations and the associated difficulties of interpretation apply to component analysis. It has been emphasized many times that one cannot sensibly argue from correlation at an areal level to correlation on an individual basis (Robinson, 1950). Component analysis is based on areal correlations, therefore great care must be taken when making inferences about individuals.

Secondly, there is the problem arising from the size of the areal units used in the analysis. It is known that correlation between the same characteristics but for

different sized areal units may vary quite markedly. There is a tendency for a correlation coefficient to increase as the size of the areal units increase, caused by the averaging out of extreme values, which may be present at a smaller scale. The results can only be taken as valid for the specific units used in the analysis as they could be very different had larger or smaller units be used (Murdie, 1969). The variability in terms of size of the enumeration districts within the city may also create problems, particularly with regard to the degree of homogeneity within any one unit. The smaller size of British census units compared to those in the U.S.A. proves advantageous in that they are more likely to be homogeneous (Herbert, 1967).

Thirdly there is the question of the validity of the information from the 10% census. It has often been regarded as unreliable, but it provides essential social information which is vital to such an analysis. Past studies have suggested that major inaccuracies are not common but this cannot be ignored as a potential source of errors.

Fourthly there is the problem of non-linearity of some bivariate distributions. The correlation coefficients may underestimate the degree of association between some variables because the product-moment correlation coefficient is a measure of linear association (Robson, 1968). Moser and Scott in 1961 found that transformation of the data had no significant effect on their correlations, consequently it may be necessary to accept a degree of underestimation.

Finally, perhaps the most important problem of all

arises from the selection of the variables for the analysis. Since components are linear combinations of the original variables the output is entirely conditioned by the variables which compose the original matrix. Utmost care is therefore essential to prevent over or under representation of any group of variables (Davies and Lewis, 1973) and to provide as wide a spectrum as the census permits.

Component Analysis Procedure

The variables chosen from the census (thirty-five in this study) are first standardized to give zero mean and unit variance. Correlations are then calculated between each pair of variables (R-mode analysis) for all the cases (1347 enumeration districts in Edinburgh). The next step is to explore the data-reduction possibilities by constructing a set of new variables on the basis of the interrelations exhibited in the data (Nie, Bent and Hull, 1970). In a principal components analysis this step will define the new variables as exact mathematical transformations of the original data. These components are orthogonal, i.e. uncorrelated to each other and provide the best linear combination of variables for the data. Principal-components analysis requires as many components as there are variables to absorb all the variation in the data. As the first component extracted will be the single best summary of the linear relationships in the data and successive components account for less and less of the residual variance, the first four or five components generally absorb over half

of the total variance and only these few need to be interpreted.

The output at this stage is called the 'component loading matrix'. Each original variable has a loading between +1.00 and -1.00 on each component, indicating the degree of association between variable and component. These general components may be interpreted but it is usually more rewarding to perform a 'simple structure' rotation before interpreting. This rotation gives a simpler and more meaningful pattern because each component is then more likely to define a distinct cluster of interrelated variables. Before rotation, components may be located between independent clusters of interrelated variables whereas after rotation each variable is identified with one or only a small proportion of components (Rummel, 1970). The number of variables loading highly on a component is minimized thus making interpretation much easier. The components analysis in the present study was performed using the S.P.S.S. 'Factor Analysis Procedure Package' (Nie, Bent and Hull, 1970, Ch. 17, pp. 208-244). The rotation option chosen was 'Varimax' which gives an orthogonal simple structure rotation which aims to simplify the columns of the factor matrix and maximise the variance of the squared loadings in each column.

Component Analysis of Edinburgh

The thirty-five variables used in the present study are given in Table 3.2. They have been grouped into broad

Table 3.2 Variables in Component Analysis of Edinburgh

Age

1) % of the population between 0 and 14 years of age.

2) % of the population between 15 and 24 years of age.

3) % of the population between 25 and 44 years of age.

4) % of the population between 45 and 64 years of age.

5) % of the population over 65 years of age.

Demographic

6) % of females in the total population

7) fertility ratio - persons aged 0-9 years as a % of females aged 15-44 years.

8) % of single/widowed/divorced persons in the population.

9) Number of one parent families.

Socio-Economic

10) % of household heads in socio-economic groups 3 and 4 (professional)

11) % of household heads in socio-economic groups 1, 2, 13 (employers and managers)

12) % of household heads in socio-economic groups 8, 9, 12, 14. (foremen and skilled workers)

13) % of household heads in socio-economic groups 5, 6. (non-manual and intermediate workers)

14) % of household heads in socio-economic groups 7, 10, 15. (personal service and agricultural)

15) % of household heads in socio-economic group 11 (unskilled manual workers)

Tenure

16) % of households which are owner-occupiers.

17) % of households renting from Local Authority.

18) % of households renting private unfurnished accommodation

19) % of households renting private furnished accommodation

20) % of households living in shared dwellings

Household Structure /

Table 3.2 (Contd.)

Household Structure and Facilities

21) % of households with all amenities exclusive

22) % of one person households

23) % of two person households

24) % of households with six or more persons

25) % of households with an occupancy rate of over 1½ persons per room

26) % of economically active males in the total population

27) % of economically active females in the total population

28) % of all economically active, employed at the time of the census

Population Movement

29) % of total population born outside of the U.K.

30) % of population moving within the Local Authority area in last year

31) % of population moving within the Local Authority area in last five years

32) % of population moving into the Local Authority area in the last year

33) % of population moving into the Local Authority area in the last five years

Others

34) % of households with two or more cars

35) % of households with no car

All variables came from the 1971 Census of Scotland and were for the 1,347 enumeration districts of the City of Edinburgh.

classes which contain approximately equal numbers in an attempt to ensure a balance. The chosen variables reflect those which have been particularly useful in defining urban structure in other studies (Davies and Lewis, 1973; Rees, 1970; Herbert, 1970; Robson, 1969). All information came from the 1971 Census and was for the 1,347 enumeration districts of the City of Edinburgh as then defined and does not include areas which were incorporated in the 1975 re-organization of local government in Scotland.

The initial components loading matrix was not interpreted. The rotated matrix is shown in Table 3.3 and shows the nine components which have eigenvalues greater than 1.00. These nine components in decreasing order of amount of explained variance together account for 69.27% of the total variance. Only the first five were interpreted as the others were found to be associated with fewer and fewer variables making interpretation more difficult. Only those variables with loadings greater than +/- 0.4 were taken as having significant association with the components and interpretation was also aided by employing a grouping scheme of high, medium and low on the loadings, as described in Table 3.4.

The communality of the variables shown in Table 3.3 illustrates the proportion of the variable's total variation that is involved in the components (Rummel, 1970). This distinguishes the most discriminating variables (i.e. those most involved in all components) which could be used to give a description of urban structure. The two most powerful

Table 3.3 Rotated Component Loadings Matrix

Variables	Components					
	1	2	3	4	5	6
1) % popln. 0-14 yrs.	-	-	0.88846	-	-	-
2) % popln. 15-24 yrs.	-	-	-	0.51335	-	-
3) % popln. 25-44 yrs.	-	-	0.73162	-	-	-
4) % popln. 45-64 yrs.	0.67354	-	-	-	-	-
5) % popln. over 65 yrs.	0.77335	-	-	-	-	-
6) % popln. female	0.79964	-	-	-	-	-
7) fertility ratio	-	-	0.72397	-	-	-
8) % sing/wid/div.	0.62915	-	0.54587	-	-	-
9) % lone parents	-	-	-	-	-	-
10) % S.E.G. 3,4	-	0.71361	-	-	-	-
11) % S.E.G. 1,2,13	-	0.73898	-	-	-	-
12) % S.E.G. 8,9,12,14	-	-0.62829	-	-	-	-
13) % S.E.G. 5,6	-	-	-	-	0.67161	-
14) % S.E.G. 7,10,15	-	-0.43855	-	-	-	-
15) % S.E.G. 11	-	-	-	-	-0.64295	-
16) % owner occ.	-	0.62511	-	-	0.46993	-
17) % L.A. Rent	-	-0.45073	-	-	-	0.67240
18) % unfur. P.R.	-	-	-	-	-	-0.75589
19) % fur. P.R.	-	-	-	0.85344	-	-
20) % shared acc.	-	-	-	0.69151	-	-
21) % all am excl.	-	-	0.42561	-	-	0.61791
22) % 1 person h/hs	0.70672	-	-	-	-	-
23) % 2 person h/hs	0.75627	-	-	-	-	-
24) % h/hs over 6 pers.	-	-	0.60380	-	-	0.42034
25) % h/hs over 1½ p.p.r.	-	-0.52644	0.40196	-	-0.46578	-
26) % E.A. Males	-	-	-	-	-	-
27) % E.A. Females	-	-	-	-	-	-
28) % employed	-	-	-	-	-	-
29) % born ex-U.K.	-	-	-	0.67974	-	-
30) moved in L.A.A. 1 yr.	-	-	-	-	-	-
31) moved in L.A.A. 5 yrs.	-	-	-	-	-	-
32) moved into L.A.A. 1 yr.	-	-	-	0.46330	-	-
33) moved into L.A.A. 5 yrs.	-	-	-	0.55330	-	-
34) % h/hs with two+ cars	-	0.84644	-	-	-	-
35) % h/hs no car	0.55145	-0.66956	-	-	-	-

Table 3.3 (Contd.)

	Components					
	1	2	3	4	5	6
% Variance accounted for by each component	12.53	12.28	10.41	9.00	6.74	5.77
Cumulative percentage	12.53	24.81	35.22	44.22	50.96	56.73

Only those loadings greater than +/-0.4 are given.

Table 3.3 (Contd.) Rotated Component Loadings Matrix

Variables	Components 7	8	9	Communality
1) % popln. 0-14 yrs.	-	-	-	0.89303
2) % popln. 15-24 yrs.	-	-	0.48946	0.70982
3) % popln. 25-44 yrs.	-	-	-	0.77794
4) % popln. 45-64 yrs.	-	-	-	0.78270
5) % popln. over 65 yrs.	-	-	-	0.79345
6) % popln. female	-	-	-	0.88721
7) fertility ratio	-	-	-	0.63956
8) % single/wid./div.	-	-	-	0.86130
9) % lone parents	-	-	-	0.27667
10) % S.E.G. 3,4	-	-	-	0.58274
11) % S.E.G. 1,2,13	-	-	-	0.59257
12) % S.E.G. 8,9,12,14	-	-	-	0.58938
13) % S.E.G. 5,6	-	-	-	0.60254
14) % S.E.G. 7,10,15	-	-	-	0.39415
15) % S.E.G. 11	-	-	-	0.56315
16) % owner occupied	-	-	-	0.78771
17) % of L.A. Rent	-	-	-	0.90181
18) % unfur. P.R.	-	-	-	0.74151
19) % fur. P.R.	-	-	-	0.76898
20) % shared acc.	-	-	-	0.56239
21) % all am. excl.	-	-	-	0.84590
22) % 1 person h/hs.	-	-	-	0.79393
23) % 2 person h/hs.	-	-	-	0.74756
24) % h/hs. over 6 pers.	-	-	-	0.69053
25) % h/hs. over 1½ p.p.r.	-	-	-	0.69128
26) % of E.A. males	0.75774	-	-	0.66206
27) % of E.A. females	-	-	0.84026	0.74160
28) % employed	-	-	-	0.38098
29) % born ex-U.K.	-	-	-	0.58591
30) moved in L.A.A. 1 yr.	-	0.82318	-	0.69253
31) moved in L.A.A. 5 yrs.	-	0.78315	-	0.66664
32) moved into L.A.A 1 yr.	0.52974	-	-	0.60643
33) moved into L.A.A. 5 yrs.	0.41232	-	-	0.66675
34) % h/hs with two+ cars	-	-	-	0.76253
35) % h/hs no car	-	-	-	0.91262

Table 3.3 (Contd.)

Variables	Components			Communality
% Variance accounted for by each component	4.46	4.45	3.63	80.52% of the total variation in the data is patterned
Cumulative percentage	61.19	65.64	69.27	

Only those loadings greater than +/-0.4 are given.

Table 3.4 Composition of Components

Variables	Loadings		% variability absorbed by component
Component 1	High		
% popln. female	+0.79964		63.94
% over 65 yrs.	+0.77335		59.80
% 2 person h/hs.	+0.75627		57.19
% 1 person h/hs.	+0.70672		49.94
	Medium		
% 45-65 yrs.	+0.67354		45.36
% single/wid./div.	+0.62915		39.58
% with no cars	+0.55145		30.40
Component 2	High		
% two or more cars	+0.84644		71.64
% S.E.G. 1,2,13	+0.73898		54.64
% S.E.G. 3,4	+0.71361		50.92
	Medium		
% h/hs. owner occ.	+0.62511		39.07
% with no cars		-0.66956	44.83
% S.E.G. 8,9,12,14		-0.62829	39.47
% h/hs over 1½ p.p.r.		-0.52644	27.71
	Low		
% L.A. rental		-0.45073	20.31
% S.E.G. 7,10,15		-0.43855	19.23
Component 3	High		
% popln. 0-14 yrs.	+0.88846		78.93
% popln. 25-44 yrs.	+0.73162		53.52
fertility ratio	+0.72397		52.41
	Medium		
% h/hs. over 6 persons	+0.60380		36.45
% single/wid./div.	+0.54587		29.79
	Low		
% h/hs all am. excl.	+0.42561		18.11
% h/hs. over 1½p.p.r.	+0.40196		16.15

Component 4/

Table 3.4 (Contd.)

Variables	Loadings		% variability absorbed by component
Component 4	High		
% furnished p.r.	+0.85344		72.83
	Medium		
% shared acc.	+0.69151		47.81
% born ex-U.K.	+0.67974		46.20
moved into L.A.A. 5 yrs.	+0.55330		30.61
% popln. 15-24 yrs.	+0.51335		26.35
	Low		
moved into L.A.A. 1 yr.	+0.46330		21.46
Component 5	Medium		
% S.E.G. 5,6	+0.67161		45.10
% S.E.G. 11		-0.64295	41.33
	Low		
% h/hs. owner occ.	+0.46993		22.08
% h/hs. over 1½ p.p.r.		-0.46578	21.69

Only the first five components were interpreted and Component Eight.

Component 8	High		
moved in L.A.A. 1 yr.	+0.82318		67.76
moved in L.A.A. 5 yrs.	+0.78315		61.33

variables in this respect are the percentage of households with no car and the percentage of households in local authority accommodation.

Of the components described here, two were socio-economic status components, two life cycle/age structure components, one housing/tenure component and one of mobility within the city.

Interpretation of Components

Component One accounts for 12.53% of the variance and has high positive associations with four variables, viz.

1) the percentage of females in the population,
2) the percentage of persons over 65 years of age,
3) the percentage of two person households in the population, and
4) the percentage of one person households in the population.

This component then is identified positively with areas of one and two person households with single, widowed and divorced, female household heads (mainly widowed), predominantly over 65 years of age, with no cars. This may be seen as a life cycle component expressing the completed family group or families which have started to lose members. Davies and Lewis (1973) found a similar pattern in their study of Leicester but there was an association with obsolescence and lack of modern facilities which was not evident in Edinburgh. It might be expected that such a component would delimit areas such as Morningside, Ravelston Dykes,

Murrayfield and the older Local Authority housing schemes where there is a predominance of these types of households, but this will be fully investigated later.

Component Two accounts for 12.28% of the total variance and has high positive associations with three variables. The percentage of households owning two or more cars is the most important variable here, the component absorbing 71.6% of its total variability. The percentage of household heads who are in socio-economic groups 3 and 4 and those in groups 1, 2 and 13 provide the other two high associations. These are people in professional and managerial positions and employers. There is also a reasonably high positive association with owner occupation (+0.625). On the other hand there is an important negative association with households who do not own a car, those who are foremen and skilled workers and who live at an occupancy ratio of over 1½ persons per room. However there is only slight negative association with percentage of households who live in Local Authority housing and those who work in personal service.

This component can be viewed as discriminating on the basis of socio-economic status, with areas of two (or more) car families of high socio-economic status living in their own homes contrasting with non-car owning households who are predominantly skilled workers with high occupancy rates perhaps living in Local Authority housing schemes.

This socio-economic status factor has been found in other studies in Britain, being almost identical to the

first factor in Davies and Lewis' study of Leicester (1973) and similar to Robson's first component in his study of Sunderland (Robson, 1969). The component is almost identical to the first component found in another recent study of Edinburgh (Cargill, 1976), and accords well with others found in studies of South Wales cities (Evans, 1973). This dimension is also one of the three factors which occurs repeatedly in North American studies, although composed of different discriminating variables.

Component Three again has high positive associations with three variables. It explains 7%.9% of the variability of households with children under fourteen years of age and over 50% of the variability of the fertility ratio and the percentage of households with members between twenty-five and forty-four years of age. There is also a strong positive relationship with large families and single, widowed and divorced persons (single mainly, one would presume). Slight association is also found with households which have exclusive use of all amenities and the percentage of households with an occupancy rate of greater than 1½ persons per room. It accounts for 10.41% of the total variability.

This can be taken as the second life cycle component and distinguishes areas with comparatively large numbers of children and adults in the child bearing and rearing stages of the life cycle. It illustrates areas which have high fertility ratios, large families, a large single status population who live at high occupancy rates but who also have good housing facilities. This might be expected to

delineate the areas of Local Authority housing in the city, particularly the newer estates and also possibly the modern private housing areas away from the centre of the city. Therefore Component Three has similarities with Shevky-Bell's index of urbanization. The similarity with Robson's fourth component in Sunderland is also striking (Robson, 1968) and likewise Cargill's second component in Edinburgh (Cargill, 1976) and Evans' fifth component in Cardiff and Swansea (Evans, 1973).

Component Four has only one variable with which it has a high positive association; this is the percentage of privately rented, furnished accommodation. However, strong positive associations are also found with the percentage of shared accommodation, the percentage of foreign born, the percentage of persons who moved into Edinburgh between 1966 and 1971, and the percentage of the population aged between fifteen and twenty-four years. The component then delimits those areas which have high proportions of shared, privately rented, furnished accommodation with an immigrant and mobile, young adult population. Similar components have been found elsewhere e,g. component three in Swansea and Cardiff and component four in Newport (Evans, 1973), component six in Cargill's Study of Edinburgh (Cargill, 1976), and component five in Leicester (Davies and Lewis, 1973). Davies and Lewis attributed this component to a large student population and the presence of young commercial workers. It seems likely that the large numbers of mobile, young adults who

apparently live in the areas of privately rented, furnished accommodation in Edinburgh, can be attributed to a large student population and the large number of workers necessary to perform the many commercial and administrative functions in the city. It would be expected that this component would show a central/peripheral dichotomy, with high positive scores around the University areas, the New Town and the areas of older tenement blocks which provide the best opportunity for private rental. This 'youth' component may in some ways be likened to the immigrant zone of transients found in North American cities.

Component Five has no high loadings but appears to reflect a second socio-economic status component which has positive associations with household heads who are in non-manual and intermediate occupations and who are owner-occupiers and a negative association with manual workers and those who live at an occupancy ratio over 1½ persons per room.

This is a less well defined component and although it delineates a combination of variables which is statistically significant it is less easy to interpret. Certainly, beyond this fifth component meaningful interpretation becomes more difficult. Component eight however, which explains only 4.45% of total variance can be seen to be describing those areas where there has been a movement of people within the city. As this factor does not relate to any other of the socio-economic variables in the analysis it suggests that movement within the Local Authority area

forms a distinctive element on its own in the urban social structure.

Component Scores

The matrix of component scores enables one to relate the extracted components to the areal units used in the analysis. Each of the 1,347 enumeration districts used is given a score for each component and consequently the city can be mapped in terms of areas with like scores. Scores are calculated by each variable being weighted proportionately to its loading. Each enumeration district's data on each variable is then multiplied by the loading. The sum of these weight-times-data products for all variables involved in any particular component then yields the component score for each enumeration district (Rummel, 1970).

Before mapping, the distribution of component scores was investigated to give some guide to the choice of class intervals. The class intervals consequently vary between components, because of the use of natural cut-off points suggested by the histograms. All component scores were subdivided into five categories ranging from very high to very low which enables a degree of comparability between maps (Figure 3.1).

Component One which is the first life cycle component has a positive association with the completed family group and families in the process of dissolution. The almost normal distribution of scores means that the vast majority

of enumeration districts are close to the average with a slight negative skew. No very high scoring areas were found (Figure 3.2).

The map of this component shows that there is a broad central/peripheral division, those areas with below average numbers of completed family groups being predominantly in the south, west and north-west of the city. This area of low scoring enumeration districts curves round in an arc from Piershill and Magdalene in the east, south and westwards along the edge of the Pentlands and north around the suburbs to Cramond.

There are small patches of highly scoring enumeration districts around the city in Morningside, Merchiston, Liberton, Stenhouse, Slateford, Comely Bank, Leith, Portobello and Joppa and in the city centre itself. Those areas with above average numbers of older, smaller sized households form a broad belt running south-west to north-east, following the older, low lying areas of the city. As this component also has a slight association with households not owning a car, it is possible that this distribution will partly be illustrating areas with low socio-economic status as well as the more important demographic attributes.

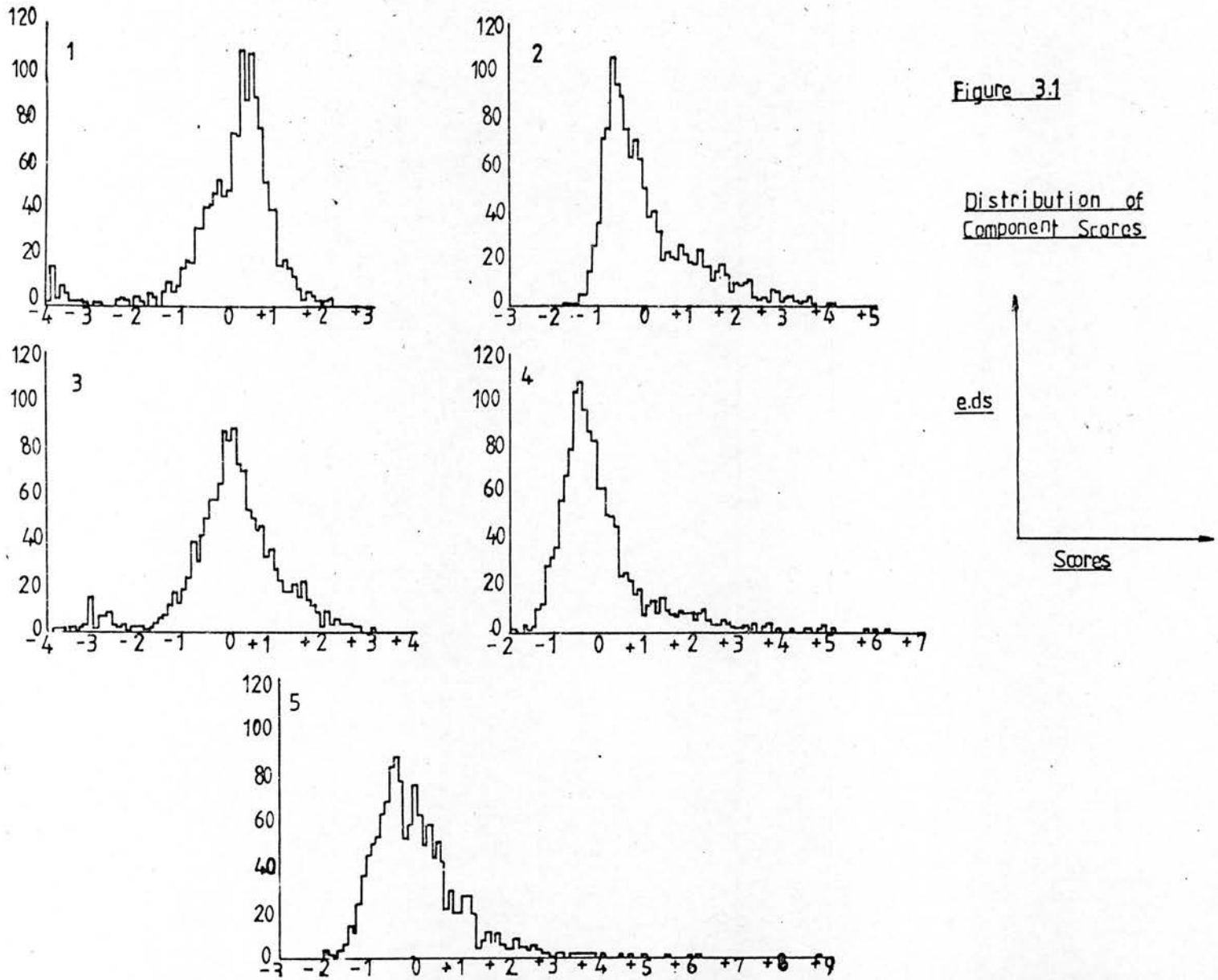
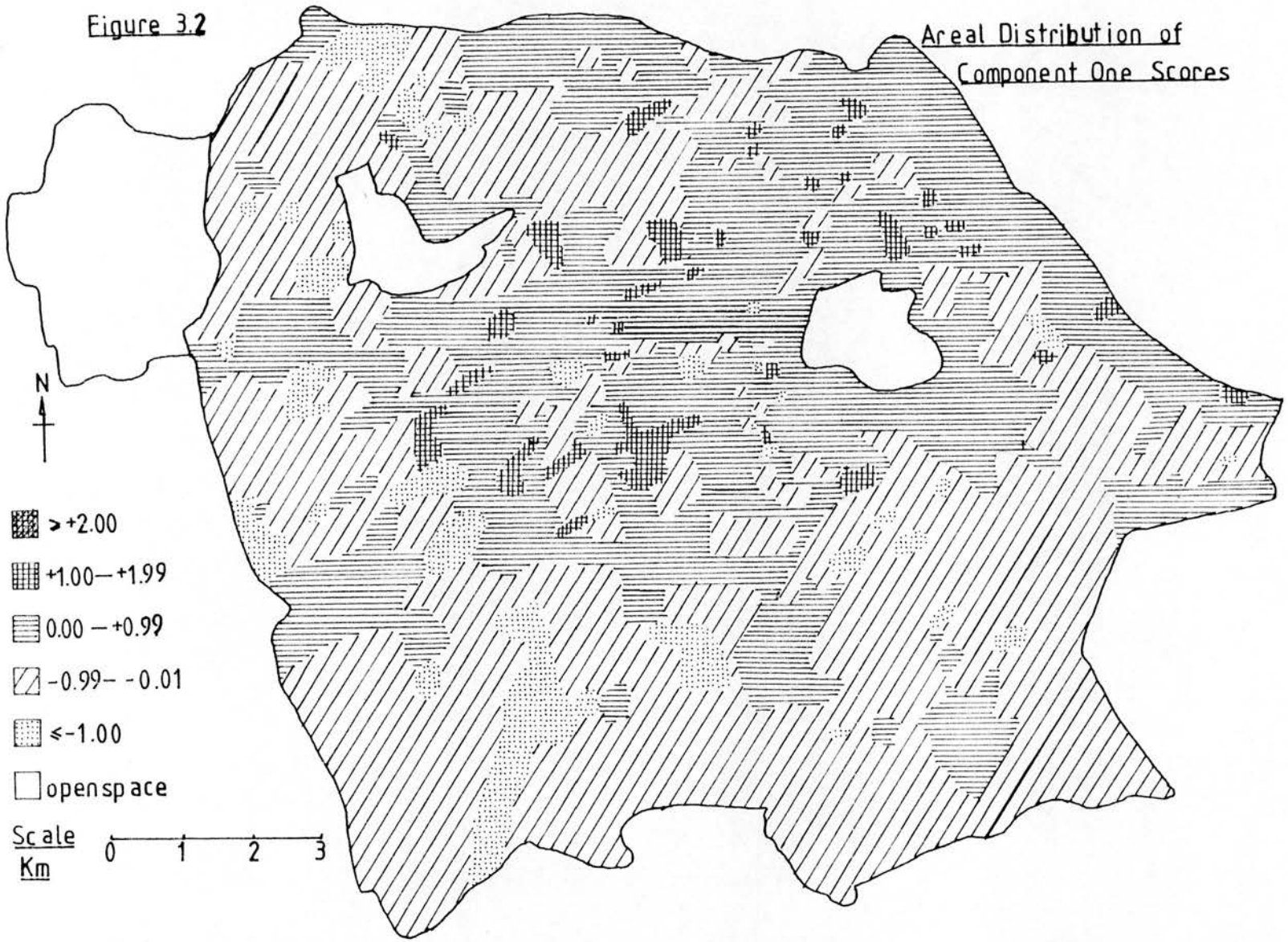


Figure 3.1

Distribution of Component Scores

Figure 3.2


Areal Distribution of
Component One Scores
N
> +2.00
+1.00 — +1.99
0.00 — +0.99
-0.99 — -0.01
≤ -1.00
open space
Scale
Km
0
1
2
3

Areas with very low scores, indicating areas with few older, small sized households mainly coincide with the peripheral Local Authority housing estates such as Craigentinny, Niddrie and Craigmillar in the east, Gilmerton, The Inch and Oxgangs in the south, Sighthill, Slateford, Longstone and Clermiston in the west, and Drylaw, Muirhouse and Pilton in the north. There are other small isolated areas around the city such as Dalry, Newington and in Leith and a large area in the south centred on Redford Barracks and the surrounding army houses which naturally do not have a predominantly elderly population structure.

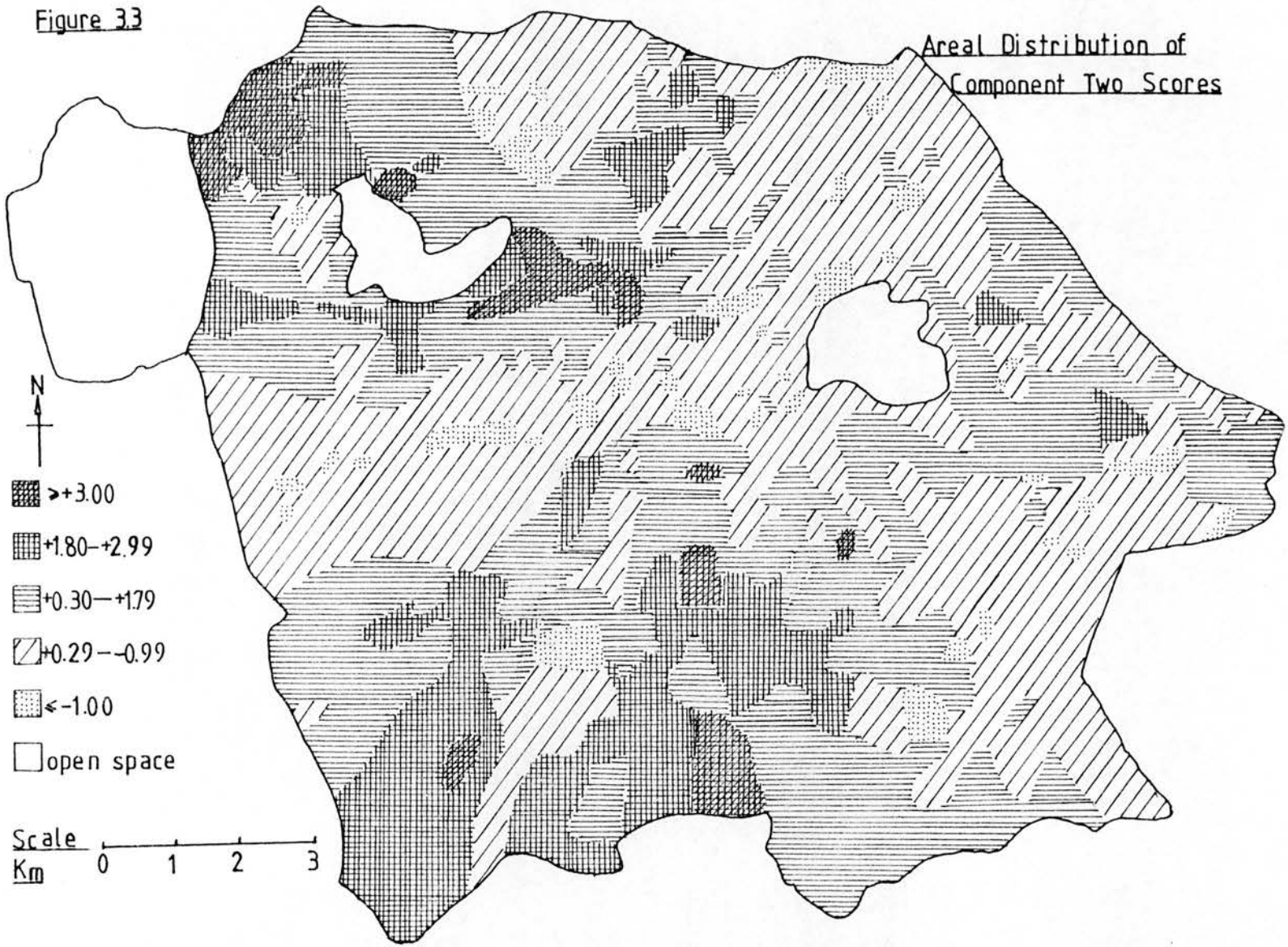
Component One then has a generally central/peripheral division with the areas which have a high proportion of older, smaller households being found in the central areas and in a south-west to north-east sector coinciding with the older housing and industrial areas of the city. Those areas with low and very low percentages of the older, smaller households are in the outer suburbs and in the new, large peripheral Local Authority housing estates.

Component Two has a distinct positively skewed distribution with the majority of enumeration districts having a low socio-economic score (Figure 3.3). As in the first component the most striking feature is a south-west to north-east sector, but here it is narrower and more clearly defined. This belt of low socio-economic status stretches from Sighthill and Wester Hailes in the west, through Stenhouse, Gorgie and Dalry to the Old Town,

broadening out around Arthur's Seat and Easter Road and stretching west to Canonmills and along the Water of Leith to Leith itself, and east to Lochend, Restalrig, Joppa and Eastfield. In the south-east a large area of low socio-economic status is defined around the council housing areas of Niddrie, Craigmillar, The Inch, Gilmerton, Gracemount, Burdiehouse and Southhouse. Similarly the Oxgangs, Clermiston, Drylaw, Muirhouse, Pilton and Granton estates can be picked out by the areas of low socio-economic status in other parts of the city.

In contrast, those areas with average, high and very high scores on the socio-economic status component are in two main blocks in the west, north and south of the low status sector. There is a gradation from the low status areas to average and then high and very high status areas adjoining open spaces and higher ground such as Corstorphine Hill, Blackford and Braid Hills and the Pentlands. In other areas of the city, such as Trinity, Craigentinny there are relatively small high class areas around the periphery of golf courses and parks. The most distinct sector of high status stretches from the west end of Princes Street to Ravelston Dykes, Murrayfield, Corstorphine and Blackhall. Very high status areas are found around Corstorphine Hill and at Barnton, Cammo and Cramond.

Figure 3.3


Areal Distribution of
Component Two Scores
N
≥+3.00
+1.80–+2.99
+0.30—+1.79
+0.29—-0.99
≤-1.00
open space
Scale
Km
0
1
2
3

In the south very high scores are found around Blackford Hill, Fairmilehead and Bonaly. Again there is a grading down to high and average before joining the low socio-economic status sector. Areas of low socio-economic status push out into the high status areas along the major roads in Newington and Morningside. Both high status sectors have constrasting areas of low status in their midst corresponding to the Local Authority housing estates of Clermiston in the west and Oxgangs and the army area of Redford Barracks and Dreghorn in the south.

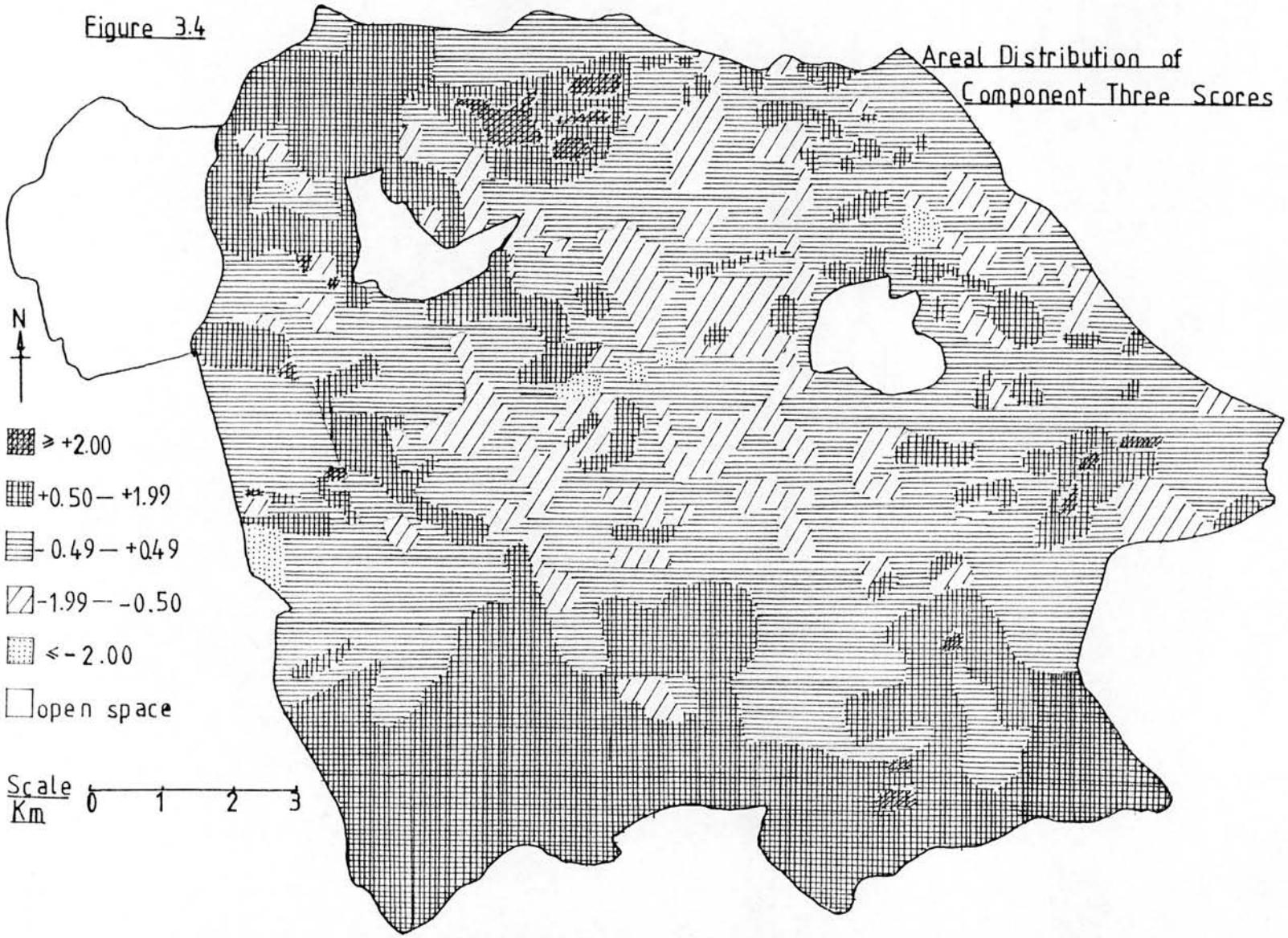
Component Two, then, has a generally sectoral form which agrees with many previous studies. The gradation from low to high and then very high seems to support Hoyt's ideas on high class residential areas (Hoyt, 1939). The low-status areas follow the low-lying ground of the Water of Leith from Sighthill in the west to Leith itself at the coast. Other areas are on the coastal plain at Muirhouse, Pilton, Drylaw and Granton and in the south, the Craigmillar and Niddrie areas coincide with the low-lying areas south of Arthur's Seat. The high status areas are predominantly centred on the higher areas around the open spaces of Corstorphine Hill in the north-west and the Braid Hills, Blackford Hill and the Pentlands in the south.

Component Three has a nearly normal distribution and has a spotty peripheral distribution in the city. The areas with high percentages of children and young families are found in the Local Authority housing estates,

predominantly the larger ones such as West Pilton, Muirhouse and Granton in the north and Craigmillar, Niddrie, Moredun, Southhouse and Burdiehouse in the south (Fig. 3.4). Other small areas of very high scores are also found in Clermiston and Sighthill. The Wester Hailes area might have been expected to have had a similarly high score but has in fact a very low score on this component. This can be explained by the fact that only a small part of the huge scheme was occupied at the time of the 1971 census. The vast majority of houses there were first occupied between 1972 and 1974.

Areas with very low scores are also small and dispersed throughout the city such as around the Grassmarket and High Street, Fountainbridge, Gorgie, Easter Road and in Leith. Low scoring areas, those with a lower than average number of young families, are confined mainly to the south-west to north-east sector found above. These areas appear to correspond partly to the tenement housing areas of the Old and New Towns which (as shown in Component Four) are predominantly shared, privately rented, furnished accommodation occupied by young unmarried adults or couples without children. This accords well with Bell's idea of familism being related to suburban living (Bell, 1956). There are also low-scoring enumeration districts in the higher socio-economic status areas around Corstorphine Hill, Blackhall, Queensferry Road, Fairmile-head, Grange and Newington. Possibly the rather exclusive dwellings in such areas would preclude, on financial

Figure 3.4


Areal Distribution of
Component Three Scores
N
≥ +2.00
+0.50 — +1.99
- 0.49 — +0.49
-1.99 — -0.50
≤ - 2.00
open space
Scale
Km
0 1 2 3

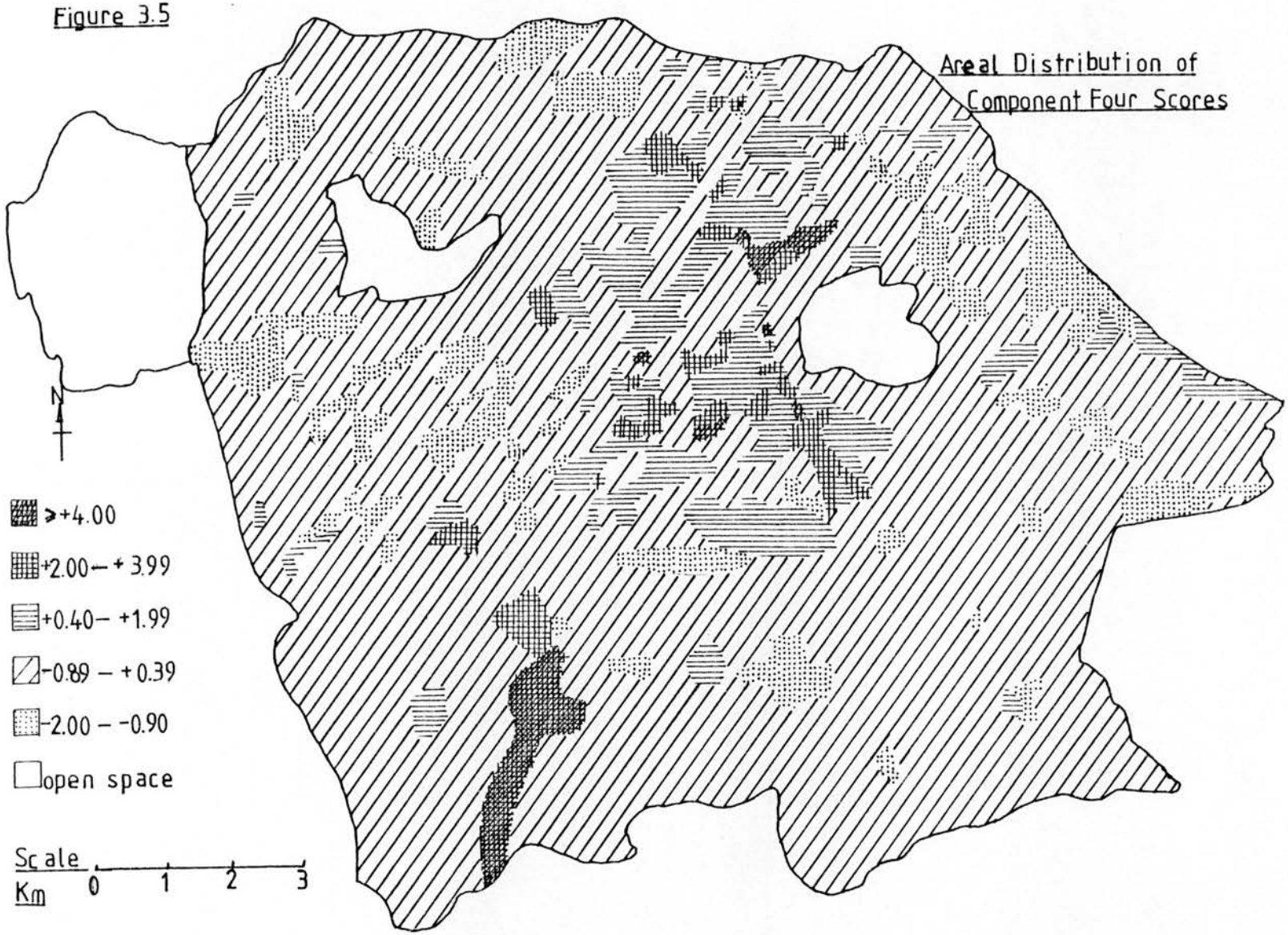
grounds, the majority of young couples and those with young families. The vast majority of the city, however, falls into a medium class where there would appear to be an evenly balanced age structure and reasonable facilities and occupancy rates.

Component Three has a marked peripheral distribution with areas which have high numbers of young, large families being picked out, particularly the peripheral council estates. Those areas with low numbers of such families have a mainly central distribution where a high proportion of the housing is privately rented and in those high socio-economic areas where the housing is expensive and exclusive.

Component Four has a positively skewed distribution and therefore the majority of enumeration districts are low scoring. This component delineates areas of shared, privately rented, furnished accommodation, occupied by mobile young adults and immigrants. This component has a very different pattern from the others as it picks out the central area of the city. The vast majority of the outer area, with only one significant exception - that of the Redford Barracks area - can be seen to score low or very low on this component (Figure 3.5).

The areas of medium, high and very high scores are almost totally restricted to a large cluster of enumeration districts stretching from Newington, Grange and Morningside in the south, to the New Town, Comely Bank, Warriston and parts of Goldenacre and Trinity in the north. This is

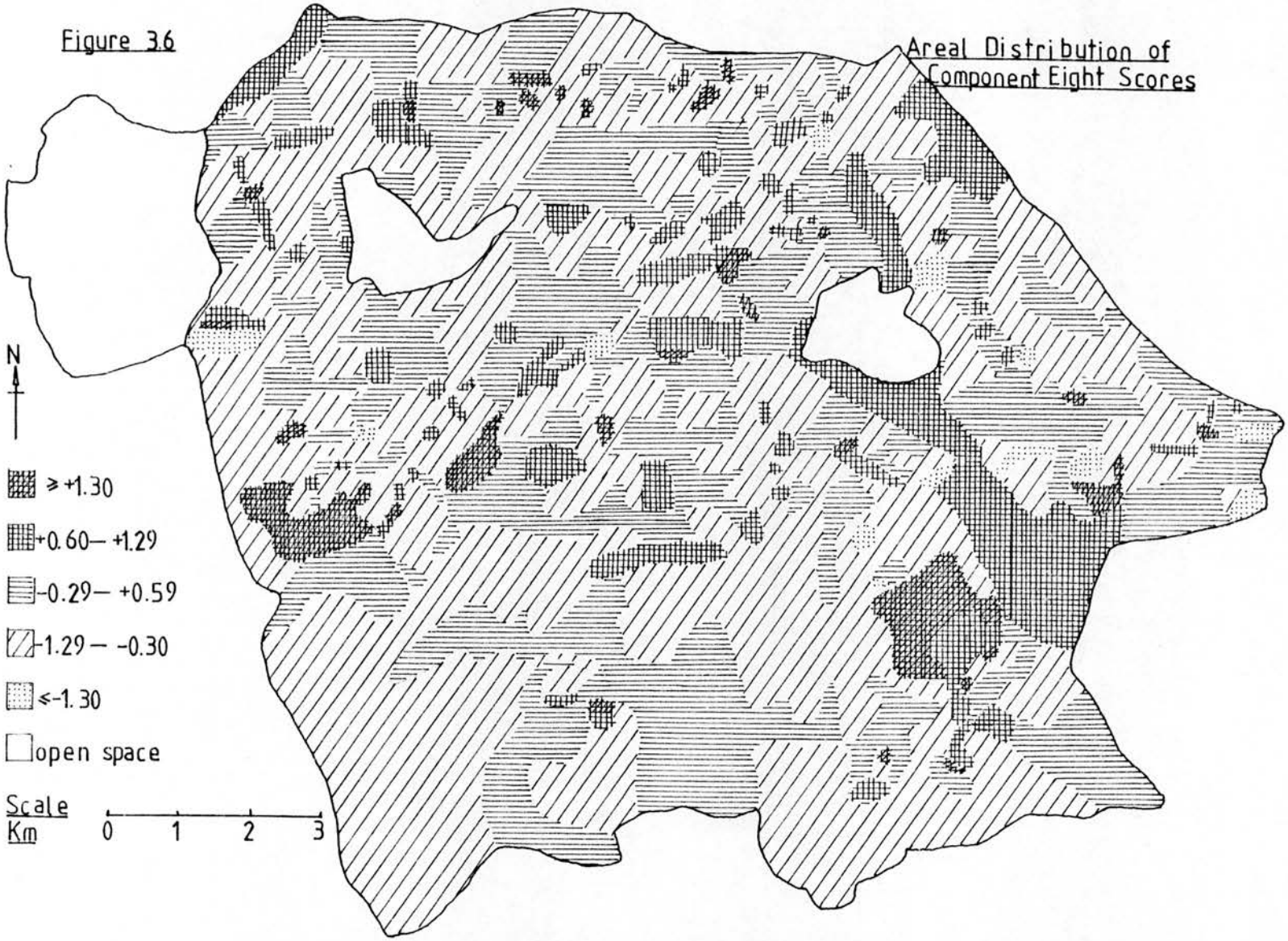
Figure 3.5


Areal Distribution of
Component Four Scores
N
≥+4.00
+2.00 – +3.99
+0.40 – +1.99
-0.89 – +0.39
-2.00 – -0.90
open space
Scale
Km
0
1
2
3

broken into two blocks by a low scoring area around the commercial centre of Princes Street, Waverley and the High Street. There are some isolated outliers of high scoring areas around Portobello, Joppa, Comiston Road and Craiglockhart and the area round Redford Barracks in the south. This component demarcates clearly those areas which have the most suitable housing stock for private rental and sharing, and it is well recognized that these are the areas of high concentrations of students and young, single people working in the city. These housing areas are also favoured by immigrants, whether through choice or because of constraints from external sources. However, immigrants are a very small part of the population in Edinburgh, with an average of only 3.7% of the population in the 1,347 enumeration districts having been born outside the U.K. The mobility aspect of the component can be explained by the nature of the population living in these areas. If, as supposed, they come to Edinburgh for educational purposes or as young single people to work in the commercial activities of the city, they are highly likely to be transients.

Figure 3.6

Areal Distribution of Component Eight Scores



The area of the city away from the centre is predominantly low scoring, having little privately rented, furnished accommodation, few young adults sharing dwellings and few immigrants. Those areas where there are very low scores partly coincides with the Local Authority housing areas especially in the west of the city at Sighthill and in the east in Leith and at Lochend and Restalrig.

This component's postive scores delimit a very distinct area of the city coinciding strongly with the areas of tenement housing.

It was felt that it would prove of little interest or be of little reward to map further components as they are less well defined and could thus be expected to give complex areal variations. However, as this study is primarily interested in mobility within the city, Component Eight was mapped. The resulting pattern was highly complex and difficult to interpret meaningfully (Figure 3.6). Areas of very high mobility did appear to be concentrated around the centre and in the peripheral council housing estates. This could be expected for undoubtedly movement within the city is facilitated by transfers and exchanges between estates. Also it is most likely that first time tenants, who by definition must have been resident within the city boundary to qualify, will move from the central areas of privately rented accommodation to their new Local Authority homes. Large areas of very high mobility in Sighthill, Gilmerton and Niddrie can probably be explained by the redevelopment of prefabricated buildings to permanent

housing between 1967 and 1971.

Apart from this it is very difficult to generalize. The south and west and most of the higher status areas seem to have lower mobility levels than the central area and northwards to Leith. These latter areas have been subject to clearance and rehabilitation schemes which have involved the movement of large numbers of people within the city, during the period covered by the census. It is recognized that higher status householders are more likely to have to move between cities on a change of employment (Rose, 1958), and as they are generally more mobile as far as day to day travel is concerned, they are unlikely to move home if employment were to change within the city. The fact, too, that the higher status householders are predominantly owner occupiers, tends to restrict their mobility over short distances (Rossi. 1955). These factors may all help to explain the lower mobility levels in the high status areas of the city.

There appear to be so many particular reasons for any area's mobility that it is hard to generalize. Area by area the pattern of mobility could probably be explained but no broad patterns can be distinguished.

Summary and Conclusions

A brief examination of the existing models of urban structure showed that the classical descriptive models of Burgess and Hoyt in particular, were no longer adequate to describe the complexities of urban living, particularly in

a British context. The building of Local Authority housing estates and the urban renewal and clearance programmes in British cities have produced great changes in urban form in recent years which have combined to decrease the relevance of such models. Alternative models of urban structure which place more emphasis on the processes contributing to the nature of urban areas and their land use arrangements were even less suitable in the present context where a delimitation of areas with similar socio-economic characteristics was sought. The use of factor and principal components analysis was an obvious solution to this problem given the ability of such techniques to cope with the wide range of data available and the complexity of the urban situation.

A principal components analysis was carried out using thirty-five variables from the 1971 census for the 1,347 enumeration districts of the city of Edinburgh. This analysis produced nine significant components which accounted for 69.27% of the total variance. Six of these were interpreted, the first five and Component Eight which was of particular interest here. The first five accounted for 50.96% of the variance and were given labels for convenience. They can be described as two socio-economic status components, two life cycle/age structure components and one housing/tenure component and one of mobility within the city.

Component One which absorbed 12.53% of the total variance was the first life cycle component, having a

positive association with areas of old, small households - those with completed family groups and those families in stages of dissolution due to children leaving home and/ or the death of one partner. This component had a broadly central/peripheral distribution in the city with high numbers of such households around the central area and the older parts of the city such as Leith, Portobello and Newhaven and along the major roads of Newington, Morningside, Lanark Road, Glasgow Road and Queensferry Road. In general the majority of these households were found in the older property of the city while the newer estates, both council and private, had predominantly low and very low scores, e.g. Oxgangs, Sighthill, Pilton, Muirhouse and Niddrie and Craigmillar and the new private housing area around Barnton. In American cities it has been found that the family cycle components tend to take on a concentric form, following Burgess' theory, however in the present study there is no real resemblance to such a pattern.

Component Two accounted for 12.28% of the total variance and was the first socio-economic status component, being positively associated with areas of high status. This component bore a greater similarity in its spatial configuration to those found in American cities than did Component One. This appeared to be generally sectoral in form, the high status areas being particularly well defined. Three main sectors of high status were found, associated to some extent with topographical features. The most clearly defined sector extended northwards and westwards

from Princes Street out to Corstorphine Hill, Barnton, Cammo and Cramond. Two sectors in the south-west were split by a narrow wedge of low status which ran from Morningside/Merchiston out to the periphery via Oxgangs and Redford Barracks. The two high status sectors on either side favoured the higher ground of the Pentlands to the west and Blackford and Braid Hills to the east. A well defined low status sector followed the low lying areas around the Water of Leith from the south-west to the north-east and two low status areas, one in the north and one in the south-east defined the large areas of Local Authority housing estates. Low status areas were also found to impinge on the high status sectors where public housing had been built in their midst, e.g. Oxgangs and Clermiston.

Component Three was the second life cycle component and accounted for 10.41% of the variance. It represented areas with households in the child bearing and rearing stages of the life cycle. Here there was a general peripheral distribution of high scoring areas with low scoring areas in the central city. Those areas which had low scores on Component One, in general, had high scores on Component Three. The peripheral Local Authority housing estates were particularly notable in this respect, for example Niddrie and Craigmillar, Pilton, Muirhouse and Granton and Sighthill. As in Component One the majority of the city appeared to have a mixed age structure scoring neither high nor low on both components.

Component Four which accounted for 9.00% of the variance, had positive associations with shared privately rented accommodation and areas of young adult and/or immigrant population. This picked out very decisively those areas with the most suitable housing stock for private rental around the central city and the tenement areas of the New Town, Newington and Morningside and the army area around Redford Barracks. It was felt that this component might have distinguished a student/youth factor in the city.

Component Five accounted for 6.74% of the variance and was a second socio-economic status component but much less clearly defined than Component Two.This picked out areas of non-manual, intermediate workers and owner-occupied households on the one hand, and unskilled manual workers and households with a high occupancy rate on the other. This component was not felt to be distinct enough to prove worthwhile mapping.

Component Eight, absorbing 4.45% of the total variance was interpreted and mapped because it was of particular interest to the study. This component outlined areas of mobility within the city. The pattern proved to be complex and difficult to make any general statement about. However, high intra-urban mobility seemed to be found in the central city areas and the peripheral areas of council housing estates. It was suggested that movement within the city and especially movement from the central area, would be facilitated by obtaining a Local Authority tenancy and

that it would be hindered or made less necessary by being an owner-occupier or of a higher socio-economic status.

The components found here relate well to those found in other British studies, as seen above, e.g. Cargill (1976) Evans (1973), Davies and Lewis (1973) and Herbert (1970). They have given a basic description of the city in terms of socio-economic status, age structure and mobility; however, it is the aim of the study to use these patterns to build a structure of social areas within the city and to relate this to the movement of households within Edinburgh. In particular, it is hoped that it will aid the investigation of movement from the wider city area into the Local Authority housing estates. It is with these aspects that the following chapter is concerned.

CHAPTER 4

THE MOVEMENT OF NEW TENANTS

Introduction

It is the aim of this chapter to use those spatial components of social structure which were shown to be of greatest importance in Edinburgh in Chapter 3 to construct a typology for the city. This in turn will be used to assess the movement of new tenants into Local Authority housing in terms of their social areas of origin and destination. A further elaboration of the movement of these households can be made by describing the socio-economic characteristics of the actual movers and the spatial properties of their moves.

Construction of a City Typology

To construct a composite picture for the city in terms of the first four components produced in the analysis in Chapter 3, it is necessary to combine enumeration districts which have similar profiles of scores over those components, to give larger agglomerations which have like characteristics. It is possible to produce such groupings manually by plotting each enumeration district in two-dimensional space and examining for natural clusters (Rees, 1970). However, this is limited to a combination of two components at any one time. Similarly, class intervals can be set and enumeration districts with similar scores allocated to the same category. This is primarily in terms of two

components with the possibility of subdividing each category in terms of a third and then a fourth component and so on (Griffiths, Davies and Chulvick, n.d.)

The most satisfactory method is to use a computer program which overcomes the restriction of two dimensions and can automatically compare enumeration districts in multi-dimensional social space. Enumeration district profiles on four components can readily be compared in one simple step and the resulting classification obtained in a more objective fashion. There is a large range of options available for such a classification (Cormack, 1971) but the initial choice must be between the logical sub-division of a population or the agglomeration of like individuals (Johnston, 1968). The second method must be used here as the aim is to build up from enumeration districts to larger units with similar characteristics. A hierarchical grouping program using Ward's algorithm was chosen as being the most suitable here (Everitt, 1974). This is an option of the computer package called Clustan 1A (Wishart, 1972).

In this program the scores for the first four components for all 1,347 enumeration districts were fed in and groups were formed in such a way as to minimize the loss of information associated with each grouping. A similarity matrix of squared Euclidean distance was calculated to allow comparisons of individual enumeration districts. Ward's algorithm calculates the Error Sum of Squares[4] for all original 'n' members to give a value to

4 Error Sum of Squares $= \sum_{i=1}^{n} x_i^2 - \frac{1}{n} \left(\sum_{i=1}^{n} x_i \right)^2$

what Ward terms the 'objective function'. Two of these 'n' subsets (i.e. enumeration districts) are selected, so that when joined they will produce the least impairment of the objective function (Ward, 1963). In this way a measure of similarity or dissimilarity between every pair of objects in the initial data set is calculated. The two most similar objects are combined and the similarities for the new object with the others are recomputed. This process continues until all objects have been combined into a single group (Anderson, 1974).

In the present study this was carried out for the first four components and the 1,347 enumeration districts. However, no successful results were obtained from the program as the very large number of enumeration districts meant that the space requirements on the computer were huge and cost and computing time was thought to be prohibitive. A similar problem was found by Rees in his study of Chicago (Rees, 1970). Before such demands were made it was thought advisable to attempt some degree of manual grouping to reduce the number of enumeration districts and to judge whether results were likely to justify the computer program. Manual and computer plots in two-dimensional space were carried out and these suggested that there were few distinct natural groupings. The vast majority of enumeration districts appeared to fall into an 'average' category. It was thus decided that manual grouping by the second method outlined above might prove to be almost as efficient, though slightly

less objective, as a computer analysis. Certainly it was felt that it would be worthwhile as an initial step to allow some assessment of the importance of the exercise to the present study.

On the basis of the scores on Components One and Two, the enumeration districts were grouped into nine classes of High, Medium and Low. The class intervals chosen were those used previously for mapping in Chapter 3 and suggested by the distribution of component scores (Chapter 3, Figure 3.1 and Table 4.1 below).

Table 4.1 Class Intervals used in Grouping

Component 1	High	Medium	Low
	$\geq$ +1.00	0.00 - +0.99	$\leq$ -0.01
Component 2	$\geq$ +1.80	+0.30 - +1.79	$\leq$ +0.29
Component 3	$\geq$ +0.50	-0.49 - +0.49	$\leq$ -0.50

This gave nine categories which was a reasonable number to map and cope with in a manual situation. This only utilizes the first two components and although they explain almost 25% of the total variance it was felt that an attempt to incorporate Components Three and Four would be worthwhile. In examining the scores on Component Three it was found that, although not inversely correlated with Component One[5], nevertheless in the broad categories used here there was a fairly high level of inverse agreement. Within these broad classes of High/Medium/Low it was found that for 79% of the total enumeration

5 Components in a Principal Components Analysis are by definition independent and the component scores resulting from an orthogonal rotation are linearly independent and uncorrelated (Rummel, 1970).

districts, when a score on Component One fell into the High category, the corresponding score on Component Three would be in the Low category and vice versa. This permitted a combination of Component One and Component Three, within the limitations above, which allowed for the inclusion of Component Three without expanding the number of social areas to be mapped.

As Component Four had a particularly areally restricted distribution of its high scores it was felt that its inclusion at this stage would not justify the vast increase in complexity of the social area map from one with nine categories to one with twenty seven or eighteen at the very least. (For the areal distribution of Component Four see Chapter 3, Figure 3.5). Consequently, Component Four was omitted from the first mapping and subsequent analysis. As the investigation was to be into movement from private rental accommodation, the polarization into high and low scoring areas on Component Four would be rather superfluous anyway, as the majority of movers, being new local authority tenants, would be coming from areas with high scores.

Examining the nine categories described above, it can be seen that the vast majority of enumeration districts do fall into a limited number of classes (Table 4.2).

Table 4.2 Number of Enumeration Districts in Each Social Area

Social Area S.E.S. /Demographic	No. of e.d.s*	%	Rank of areas
High/High	4	0.33	9
High/Medium	44	3.60	6
High/Low	43	3.52	7
Medium/High	27	2.21	8
Medium/Medium	162	13.27	3
Medium/Low	92	7.53	4
Low/High	89	7.29	5
Low/Medium	489	40.05	1
Low/Low	271	22.19	2

* Does not include institutional and shipping enumeration districts.

Over 75% of the enumeration districts are in the three classes of Low/Medium, Low/Low and Medium/Medium while 40% are found in the first category of Low/Medium. On the map of these groupings (Fig. 4.1) it is evident that the enumeration districts of low socio-economic status and medium demographic structure cover a broad band running from the north-east coast around Newhaven and Leith south-westwards through the centre of the city, around Arthur's Seat and out to Gorgie, Dalry, Merchiston and Newington. Large blocks are also seen around Granton in the north, Portobello/Joppa in the east and Newcraighall and Gilmerton in the south. Undoubtedly, the small areal size of the enumeration districts in some of these areas, particularly the central city and Leith, goes a long way towards explaining the high percentage of enumeration districts in this class.

The areas of Low/Low classification are found almost exclusively in areas of large peripheral Local Authority housing estates. This accounts for a further 22% of enumeration districts. The areas of Medium/Medium scores which account for 13.27% are found mainly bordering on the Low/Medium areas around the centre or adjoining the Local Authority estates on the periphery.

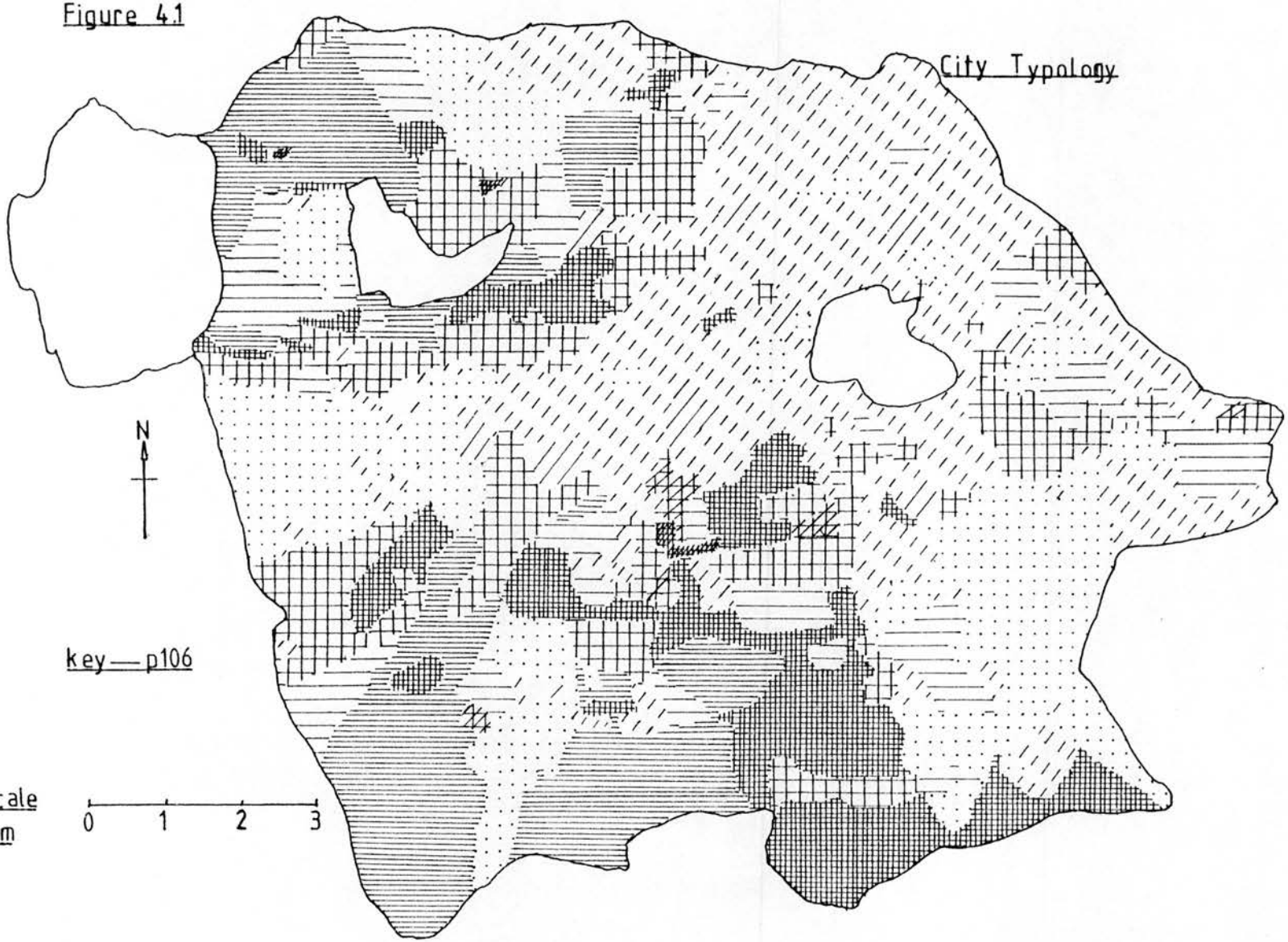
Other categories account for relatively small proportions of the enumeration districts, although their areal extent is in places greater than might be expected. On the southern edge of the city, for example, many of the enumeration districts are very large stretching into the Pentlands and this, on mapping, gives the unjustified appearance of large tracts of the city which are uniform in terms of socio-economic/demographic characteristics while in reality only small parts are populated.

This typology, although useful as a composite decription of the city in terms of the variables used, is not an end in itself. The aim in its construction is to permit an investigation of the movement into Local Authority housing in the city in relation to the type of areas which act as sources for Local Authority tenants.

Movement into Local Authority Housing

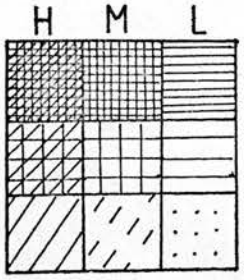
A 20% systematic sample of post-1963 new tenants on each estate was taken to enable an analysis of moves into the Local Authority sector from private accommodation to be made. This provided two distinct groups, firstly those

Figure 4.1



Key

Age



Socio-Economic Status

Age: Components 1+3

High: Component 1 ≥+1.00

Component 3 ≤-0.50

Medium: Component 1 0.00 — +0.99

Component 3 -0.49 — +0.49

Low: Component 1 ≤-0.01

Component 3 ≥+0.50

Socio-Economic Status: Component 2

High: ≥ 1.80

Medium: +0.30 — +1.79

Low: ≤ +0.29

moving from privately rented, owner-occupied and tied accommodation and secondly, those moving from shared accommodation. This latter group consisted mainly of young married couples who were living with parents or relatives and paying only a nominal rent, while waiting for a council tenancy. It was felt desirable to examine the moves of these two groups separately as a preliminary investigation showed there to be some important differences between them. The latter group, because they shared parental dwellings, were more widely distributed around the city and many were already living in council estates. On the other hand, those who were living in privately rented property and the small minority of other households, were more likely to be concentrated in the central city.

All moves were mapped and the origins and destinations were classified as falling into one of the nine 'social areas' outlined in the social area typology. This produced three origin-destination matrices (Table 4.3). Looking at the total sample first, it is evident that the majority of movement occurs in one corner of the matrix. Some 89.9% of moves terminated in the three categories of Low/High, Low/Medium and Low/Low and 81.1% originated there also. This suggests that the majority of Local Authority tenants come from areas of low socio-economic status with the largest proportion from areas with medium to young age structures. The figure of over 80% of origins and destinations compares with 69.5% of

Table 4.3 Total Moves into Local Authority Housing

		Destination									
		HH	HM	HL	MH	MM	ML	LH	LM	LL	S.E.S./Demographic Character
	HH	-	-	-	-	-	-	-	1	-	
	HM	-	-	-	-	1	-	-	4	2	
	HL	-	-	-	-	-	-	-	-	2	
O	MH	-	-	-	-	-	-	-	-	4	H - High
R	MM	-	-	-	-	7	-	1	7	24	M - Medium
I	ML	-	-	-	-	1	-	-	1	7	L - Low
G	LH	-	-	-	-	4	1	1	15	14	
I	LM	-	-	-	-	12	2	11	46	95	
N	LL	-	-	-	-	5	-	2	12	47	

Movement from Private Rental Accommodation (Including Tied and Owner Occupied)

		Destination									
		HH	HM	HL	MH	MM	ML	LH	LM	LL	S.E.S./Demographic Character
	HH	-	-	-	-	-	-	-	1	-	
	HM	-	-	-	-	1	-	-	3	1	
O	HL	-	-	-	-	-	-	-	-	2	
R	MH	-	-	-	-	-	-	-	-	2	
I	MM	-	-	-	-	6	-	1	6	18	
G	ML	-	-	-	-	-	-	-	1	5	
I	LH	-	-	-	-	4	1	1	10	11	
N	LM	-	-	-	-	8	2	10	40	76	
	LL	-	-	-	-	2	-	2	2	7	

Movement from Shared Accommodation

		Destination									
		HH	HM	HL	MH	MM	ML	LH	LM	LL	S.E.S./Demographic Character
	HH	-	-	-	-	-	-	-	-	-	
	HM	-	-	-	-	-	-	-	1	1	
O	HL	-	-	-	-	-	-	-	-	-	
R	MH	-	-	-	-	-	-	-	-	2	
I	MM	-	-	-	-	1	-	-	1	6	
G	ML	-	-	-	-	1	-	-	-	2	
I	LH	-	-	-	-	-	-	-	5	3	
N	LM	-	-	-	-	4	-	1	6	19	
	LL	-	-	-	-	3	-	-	10	40	

Table 4.4 Breakdown of Origins and Destinations

Origins	P.R.	%	SHRD.	%	Total	%
HH	1	0.4	0	-	1	0.3
HM	5	2.2	2	1.8	7	2.1
HL	2	0.9	0	-	2	0.6
MH	2	0.9	2	1.8	4	1.2
MM	31	13.9	8	7.5	39	11.8
ML	6	2.7	3	2.8	9	2.7
LH	27	12.1	8	7.5	35	10.6
LM	136	60.9	30	28.3	166	50.4
LL	13	5.8	53	50.0	66	20.1
Totals	223		106		329	

Destinations	P.R.	%	SHRD	%	Total	%
HH	-	-	-	-	-	-
HM	-	-	-	-	-	-
HL	-	-	-	-	-	-
MH	-	-	-	-	-	-
MM	21	9.4	9	8.5	30	9.1
ML	3	1.3	0	-	3	0.9
LH	14	6.3	1	0.9	15	4.5
LM	63	28.3	23	21.7	86	26.1
LL	122	54.7	73	68.9	195	59.3
Totals	223		106		329	

enumeration districts falling into the three above categories. A Kolmogorov-Smirnov two-tailed test was carried out to find if there was a statistically significant difference between the distribution of enumeration districts over the nine classes and the distribution of origins of tenants (Appendix 4.1). The difference was found to be statistically significant, therefore this is likely to be a true bias for the origins of Local Authority tenants to be in lower socio-economic status and medium to young age structure areas.

If the two groups of new tenants are viewed separately then it is interesting to note that while the majority of those from shared accommodation came from areas of low social status with a young age structure, the majority of householders from privately rented accommodation came from areas which have a low social status and a medium age structure. This reflects the high proportion of the former group which came from dwellings in Local Authority housing estates.

As would be expected few moves in either group originate in areas of high socio-economic status. Indeed, 78.8% of all moves from private rental and 85.8% of all moves from shared accommodation originated in areas of low social status. For both groups most moves end in areas which have a low social status and a predominantly young age structure. Some 89.3% of households from private rental and 91.5% of those from shared dwellings had their destinations in low socio-economic status areas.

The breakdown of origins and destinations for both groups is given in Table 4.4.

As it was felt that the origins of the two groups seemed to be different it was decided to test whether the difference was in fact statistically significant. A Kolmogorov-Smirnov two-tailed test was employed to examine the two distributions. The null hypothesis was rejected and the differences between the two groups in relation to their origins was found to be statistically significant at the 99% level (Appendix 4.2).

It had been hoped to introduce at this stage a Markov chain analysis of the movement between social areas as in Brown and Longbrake's study of Cedar Rapids, Iowa (Brown and Longbrake, 1970). This would have given a measure of the 'social distance' between areas and an indication of the ease of movement between different social groups. However, as the vast proportion of movement was restricted to only a few social areas the usefulness of such an approach was questionable. The findings here, of limited movement between different social areas agree with those of Whitelaw and Robinson (1972) who found that low and medium status area residents moved within similar status areas and were constrained by the variations in social status between areas. This contradicts the findings of Brown and Longbrake (1970) who felt that their study showed that there was little resistance to movement between different socio-economic status areas.

The rather unsatisfactory results produced by this

initial analysis suggested that the scope for more detailed study such as the use of a computer program for hierarchical grouping or the examination of larger numbers of movers, was severely limited and it was felt that this part of the study should be extended no further. Rather an examination of the moves with respect to their spatial characteristics was thought likely to be more enlightening. An examination of the two groups of movers on an individual household basis to determine any variation between them in key variables was also likely to be extremely useful, for although the areas of origins and destinations were to a large extent uniform it is not possible to infer from this anything about the individual households which were moving (Robinson, 1950).

Characteristics of Movers

From the restricted data available from the records of let, five key attributes were investigated namely: age of household head, socio-economic status, marital status, number of persons in the household and the reason for requesting a move. The distribution of movers by age group is shown in Table 4.5. Taking both groups together there is a progressive falling off in numbers as the age of household head increases; however, if the two groups are examined separately then it is evident that there is a substantial difference between them. Those from private rental are fairly evenly distributed through all age groups whereas of those moving from shared accommodation 64% are

Table 4.5 Age of Household Heads

Age	Private rental	%	Shared	%	Total	%
15-29 yrs.	56	25.11	68	64.15	124	37.68
30-44 yrs.	55	24.66	25	23.58	80	24.31
45-59 yrs.	62	27.80	6	5.66	68	20.66
60+ years	50	22.42	7	6.60	57	17.32

Table 4.6 Non-Economically Active Household Heads

Category	Private rental	%	Shared	%	Total	%
Unemployed	12	26.66	9	33.33	21	29.16
Retired	26	57.77	5	18.51	31	43.05
Housewives	7	15.55	13	48.14	20	27.77

in the 15-29 year age group and there is a dramatic fall-off in numbers over the age of 45 years. As this group is composed largely of young married couples with one child or no family who are sharing parental dwellings, then this result is to be expected.

On comparing the two age structures by Kolmogorov-Smirnov it was found that the differences between them were statistically significant at the 0.01 level (see Appendix 4.1 for χ^2 and Kolmogorov-Smirnov tests). Had the movers been taken as one group this pattern would have been obliterated. Of the variables analysed two others also showed statistically significant differences. These were the numbers of household heads in three non-economically active categories, and the reasons given for moving. In the non-economically active categories, household heads were classed as unemployed, retired or housewives (Table 4.6). For the total sample 29% were unemployed, 43% were retired and 27% were housewives. There was little difference in the numbers of unemployed in each group but for private rental household heads, 58% were retired compared with 19% of those from shared accommodation; in addition, 48% of those from the latter group were classed as housewives whereas only 15% from private rental were designated as such. These differences probably relate to the differences in age structure of the two groups and also to the slightly greater number of divorced female household heads from shared accommodation (Table 4.8).

In looking at the reasons given for moving, if both

Table 4.7 Reasons for Moving (First Stated Reasons Only)

Type of Reason	Private rental	%	Shared	%	Total	%
Family life-cycle	39	17.48	41	38.67	80	24.31
Personal/ Health	11	4.93	4	3.77	15	4.55
Social/ Environmental	50	22.42	39	36.79	89	27.05
Access	2	0.89	1	0.94	3	0.91
Involuntary	116	52.01	9	8.49	125	37.99
Unknown	5	2.24	12	11.32	17	5.16

Brief Details of Types of Reasons*

Family Life Cycle:

1) House too small due to increased family size
2) House too small due to lack of sex separation
3) House too small due to taking in an elderly parent or relative
4) Young couple sharing with parents
5) House too large
6) Family split up due to separation of spouses

Personal/Health:

1) House too small, need extra room or special facilities due to ill-health.
2) Unable to manage stairs due to ill-health
3) Ill health, need to live near relatives or friends
4) Living in unhealthy conditions

Social/Environmental:

1) House felt to be in poor area
2) House lacks basic facilities (voluntary closing)
3) Tenancy of present house in unsuitable
4) Living in poor social conditions
5) Trouble with/by neighbours

Access:

1) House too far from work
2) House too far from friends, relatives or home area
3) House has poor access to shops, school etc.

Involuntary: /

Contd. /...

* These are described more fully in Chapter 8.

Table 4.7 (Contd.)

Involuntary:

1) Clearance Area
2) Closing order (Insanitary, dangerous property, etc.)
3) Eviction
4) Fire Damage and Repairs
5) Homeless (in emergency accommodation)
6) Forced to give up tied accommodation.

This list was drawn up primarily to categorize movements between council tenancies and therefore not all categories are applicable here.

Table 4.8 Marital Status

Status	Private Rental	%	Shared	%	Total	%
Married	145	65.02	68	65.15	213	64.74
Single	32	14.34	13	12.26	45	13.67
Widowed	23	10.31	10	9.43	33	10.03
Divorced	23	10.31	15	14.15	38	11.55

Table 4.9 Number of Persons in Household

No. in HH	Private Rental	%	Shared	%	Total	%
1	50	22.42	13	12.26	63	19.14
2	66	29.59	27	25.47	93	28.26
3	50	22.42	36	33.96	86	26.13
4	30	13.45	22	20.75	52	15.80
5	15	6.72	4	3.77	19	5.77
6+	12	5.38	4	3.77	16	4.86

Table 4.10 Socio-Economic Groups

S.E.G.	Private Rental	%	Shared	%	Total	%
5,6 (non-manual, intermed.)	30	16.84	18	22.78	48	18.67
7,10 (personal service, agric.)	42	23.59	16	20.25	58	22.57
8,9,12 (foremen, skilled wkrs.)	74	41.57	21	26.58	95	36.97
11 (unskilled, manual wkrs.)	30	16.84	21	26.58	51	19.84
16 (armed forces)	2	1.12	3	3.79	5	1.94

groups are taken together, it is evident that Involuntary moves provide the greatest number followed by Social/ Environmental and Family Life Cycle reasons (Table 4.7). This again conceals important differences between the groups. Of those moving from private rental 52% moved for Involuntary reasons, mainly as a result of closing orders or clearance area schemes, while only 8.5% of those from shared accommodation gave such reasons. In contrast, 38.7% of those from shared dwellings gave Family Life Cycle reasons and 36.8% gave Social/Environmental causes as their reasons for requesting a move. This reflects the different accommodation circumstances of the two groups. Those in private rental were predominantly housed in the older tenement areas of central Edinburgh and Leith and in many cases were living in poor physical conditions. The latter group, in contrast, although perhaps also living in poorish physical conditions, were more likely to be overcrowded, especially if there were children in one or both families. Hence the large proportion of Family Life Cycle and Social/Environmental reasons given.

Few in either group gave Health or Access reasons for requesting a move. In the three remaining test variables viz.: marital status, number in the household and socio-economic group, no statistically significant differences were found although there were some variations in the numbers found in specific categories (Tables 4.8, 4.9 and 4.10).

As regards the marital status of the movers

approximately 65% were married, 14% were single, 10% widowed and 11% divorced. Slightly lower proportions of those from shared accommodation were single or widowed and a slightly higher proportion were divorced than those from private rental. The number of persons in the household does not reveal any important differences except perhaps the smaller proportion of one person households from shared accommodation and a peaking at three persons compared with two persons for private rental. This again may well be associated with the different age structures of the two groups.

Socio-economic status is very similar for both groups with a concentration of household heads in the skilled and unskilled manual workers' groups (i.e. 9 and 11). Skilled manual workers make up a much higher proportion of those from private rental than those from shared. This may be associated with age and the length of time necessary to train in many skilled occupations.

To summarize then, by looking at the individual households it has been possible to see that although moving between similar social/demographic areas, households may vary in their social and demographic characteristics. It is also evident that those moving into Local Authority housing are not an entirely uniform group. When investigated in terms of the type of previous accommodation some interesting variations were noted. Those from shared accommodation tended to have young household heads, a smaller family unit, to be unskilled manual workers

and to have requested a Local Authority tenancy because of Family Life Cycle or Social/Environmental reasons. Those households moving from private rental were from all age groups and included more one person households but also a greater proportion of larger sized family units. Household heads here were predominantly skilled manual workers and over half of all moves were classed as Involuntary.

Because the two groups have proved to be significantly different in several important respects the examination of the spatial characteristics of the moves has been carried out within a two group framework.

Spatial Characteristics of the Moves into Local Authority Housing

The investigation into the spatial character of the moves was subdivided into three parts as suggested by Brown and Holmes (1971).

1) Distance bias was examined to find whether there was a predominance of short or long distance moves and whether there was any variation in the distances moved by the two groups of new tenants.

2) Directional bias looked into the question of whether there was any preferred direction to the moves.

3) Sectoral bias described the examination of the moves to find whether movers tended to remain within a home sector rather than moving laterally across the city. This was achieved by measuring the angle created at the origin of the move when lines were drawn from the origin to the

Central Business District and between the origin and the destination.

Distance Bias

A large majority of early migration studies were concerned with the distance between the origin and the destination of a move (as seen in Chapter 2). Since Ravenstein (1885) it has been appreciated that distance is of fundamental importance in the analysis of population movement. All researchers who have plotted frequency of move against distance have shown the distribution to be positively skewed to a marked degree, with the majority of moves taking place over short distances (Moore, 1966). Possibly, movers choose destinations nearby because they wish to maintain spatial familiarity, social contacts, links or access while adjusting size or tenure. Alternatively, this predominance of short distance moves may reflect imperfections in the housing market, in that nearby alternatives are more likely to be evaluated than distant ones (Simmons, 1968).

This stands true for intra-urban movement patterns which have been shown to be far from random (Johnston, 1972). Most common among the spatial biases is the distance-decay pattern in which short moves predominate. However, move-distances are not uniform for all groups in the city and in several studies it has been shown that high status movers tend to have longer distance moves while low status movers have short distance moves mainly

within the same district (Herbert, 1972, Whitelaw and Robinson, 1972; Rose, 1958; Simmons, 1968 and Boyce, 1969). The overall uniformity of socio-economic status of both groups in the present study is likely to diminish any such variations here.

In the current study each move was measured[6] and the distance between origin and destination was noted. The two groups were investigated separately but the total picture of all moves was also examined. The distribution of distances can be seen in Table 4.11 and Figures 4.2, 4.3 and 4.4. Probably the most striking feature is the bi-modal distribution of distances found when both groups are taken together. On separating the two groups it can be seen that this distribution arises from the combination of two skew distributions.

Distances moved from shared accommodation give the expected pattern of a positively skewed distribution with short moves predominating. The distances moved from the private rental accommodation produce an unexpected negatively skewed distribution with the majority of moves being medium to long in distance. This is an anomalous situation for as seen above there have been innumerable studies at intra-urban and larger scales which have shown that the distribution of movement distances should be of a positively skewed nature. Undoubtedly this important variation can be explained by the very nature of the moves being examined here. Destinations are limited and fixed in their spatial distribution, being predominantly

6 All distances were measured in cms (5.5 cm rep. 1 Km) and the manipulations were carried out using the original measurements to save time and to reduce the chance of error in conversions.

Distribution of Distances

Figure 4.2 Total

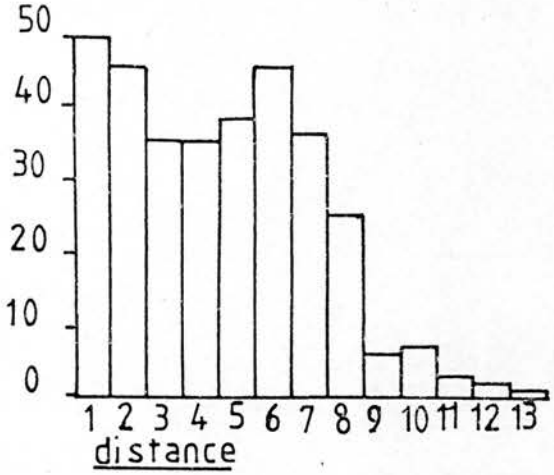


Figure 4.3 Private Rental

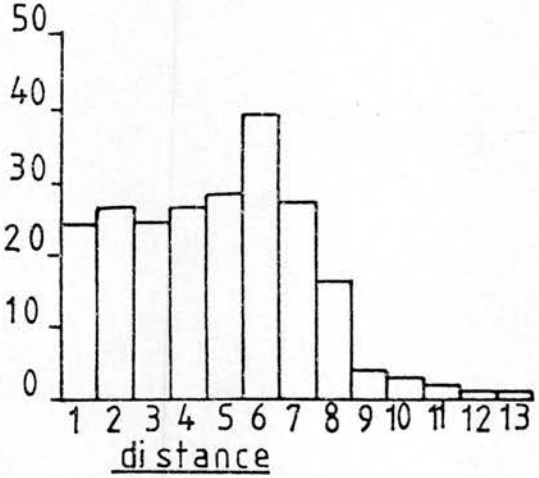
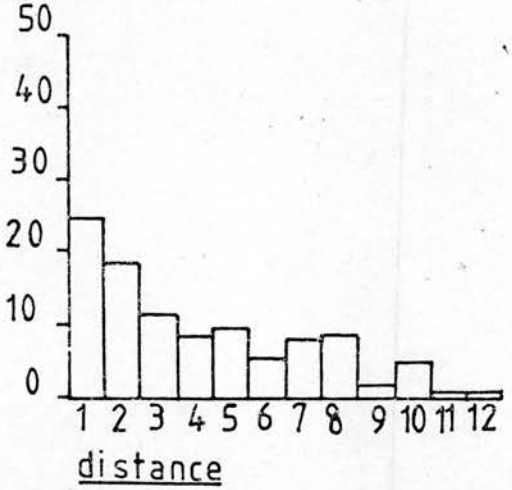
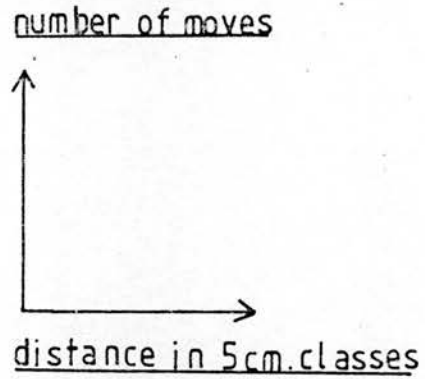


Figure 4.4 Shared





located on the periphery of the city. Origins too are fairly locationally specific in that the largest percentage of private rental property is located in the central city. Consequently, a large proportion of the moves involved here are bound to be longer than might be expected due to the relative distributions of Local Authority and private rental accommodation in Edinburgh. The fact that those moves from shared accommodation produce the 'expected', positively skewed distribution is primarily accounted for by many of them being already located within the Local Authority housing estates on the outskirts of the city and many moves are within estates rather than from the central city to the periphery.

From the two distributions and the basic descriptive measures given below in Table 4.12, it is evident that those moving from shared accommodation tend to move shorter distances than those moving from private rental. A total of 23.5% of those from shared accommodation move under 0.8 Km. and 52.8% move under 2.7 Km. On the other hand of those moving from private rental only 10.7% move under 0.8 Km. and only 33.1% move under 2.7 Km.

Table 4.12 Descriptive Characteristics of Distance Distributions

	Private Rental		Shared		Total Sample	
Mean	21.4 cm	3.89 Km	17.7 cm	3.21 Km	19.7 cm	3.5 Km
Median	22.5 cm	4.09 Km	13.5 cm	2.45 Km	21.2 cm	3.85 Km
Mode	30.5 cm	5.54 Km	8.0 cm	1.45 Km	30.5 cm	5.54 Km
Standard Deviation	12.3 cm	2.24 Km	14.3 cm	2.59 Km	14.2 cm	2.58 Km

Table 4.11 Distribution of Distances for Moves into Local Authority Housing.

Distance (cms)	Private Rental		Shared		Total	
	No.	%	No.	%	No.	%
0 - 4.9	24	10.8	25	23.6	49	14.9
5.0 - 9.9	26	11.7	19	17.9	45	13.7
10.0 - 14.9	24	10.8	12	11.3	36	10.9
15.0 - 19.9	27	12.1	9	8.5	36	10.9
20.0 - 24.9	28	12.6	10	9.4	38	11.6
25.0 - 29.9	39	17.5	6	5.7	45	13.7
30.0 - 34.9	28	12.6	8	7.5	36	10.9
35.0 - 39.9	16	7.2	9	8.5	25	7.6
40.0 - 44.9	4	1.8	2	1.9	6	1.8
45.0 - 49.9	3	1.3	4	3.8	7	2.1
50.0 - 54.9	2	0.9	1	0.9	3	0.9
55.0 - 59.9	1	0.4	1	0.9	2	0.6
60.0 - 64.9	1	0.4	0	-	1	0.3

The difference between the two groups was tested for statistical significance using a Kolmogorov-Smirnov one tailed test, (Appendix 4.9) and the null hypothesis was rejected with 99% certainty.

It was therefore extremely valuable to break down the movement into two groups as the combined distribution, being bi-modal, was initially confusing. A distance bias, where the probability of moving a shorter distance rather than a longer one is greater, does exist as

expected but only for those from shared accommodation. The very special circumstances of the relative locations of Local Authority housing and private rental accommodation and the fact that they are to a great extent mutually exclusive, produces the anomalous situation of a negative distance bias for such moves.

Directional Bias

Directional bias defined as the propensity to move in one direction rather than another, has been noted along with distance bias as being an important spatial property of intra-urban moves (Johnston, 1972). The existence of such a bias is explicit in Hoyt's sector theory (Hoyt, 1939) and Simmons (1968) suggested that directional bias resulted from sectoral variations in the socio-economic characteristics of neighbourhoods. Johnston (1969), related such patterns in London to the distribution of housing opportunities in the growing city.

In recent studies into the activity spaces and mental maps of individuals there has been a degree of overlap and often confusion between directional and sectoral bias. Complexity in the directions of moves has been apparent for some time. Caplow (1948) found only one in sixteen moves to be outwards in Minneapolis, while Johnston (1969) in London found the majority of moves to be from the centre to the periphery; however, in a similar study in Melbourne he found complex patterns of cross city moves and some migration towards the centre (Johnston, 1969a).

Clark (1971) found that central area moves were random in direction while in the outer areas an inward bias occurred. Brown and Holmes (1971) also found a preference for movement towards the centre of the city. In general however the filtering, family cycle and invasion and succession models all have their migration streams directed away from the city centre (Johnston 1971).

In Adams' important work on directional bias (Adams, 1969), it is difficult to determine whether sectoral bias or directional bias caused by an assumed concentric ring type of city structure, is being tested (Donaldson, 1973). Directional bias in the majority of studies has been measured as a propensity to move towards or away from the Central Business District. This would be of little value in the present situation as the location of Local Authority housing in the city with respect to the sources of present movers is markedly peripheral. This has already been seen to strongly influence the distance moved and would also undoubtedly, produce a strong outward bias. A more general framework was therefore adopted.

A network of 10^{o} sectors was drawn over the city, centred on the Central Business District[7] and based on an east-west line through the centre. This technique has been used before in such studies (Clark, 1972) and was described by Brown and Holmes (1971). In both cases

7 The central point of the Central Business District was taken as being the east end of Princes Street around its junction with North Bridge and including the new St. James' Centre.

however, there was the assumption that moves were from a common origin at the centre. This cannot be assumed here but a general directional pattern was all that was sought, as most moves were known to be outward in relation to the C.B.D. If the number of moves originating and the number terminating in each sector was found this would be adequate to give gross directional flows.

Both groups were taken together here as it was found that there was no statistically significant difference between them for the distribution of either origins or destinations by sectors. The distribution of origins and destinations by sector can be seen in Table 4.13. Sector 15 is outstanding in having both the highest frequency of origins and destinations. As this sector includes the new estates of Wester Hailes and the older areas of Gorgie and Dalry, this is not surprising. When the 10^{o} sectors were combined to form twelve 30^{o} sectors it can be seen that there is a bias of movement towards two areas in the city. Firstly to the south-east and the estates of Gilmerton, Craigmillar, Niddrie, The Inch and Gracemount and secondly to the west and the estates of Wester Hailes, Sighthill, Broomhouse, Longstone and Stenhouse. It is also evident that there is a marked bias away from the north-east and the older areas of the central city stretching down to Leith and Newhaven (Figure 4.5). The difference in the distribution of origins and destinations was tested by a Kolmogorov-Smirnov two tailed test and was found to be significant

at the 0.01 level (Appendix 4.10).

When the balance between the number of origins and the number of destinations was examined the south-east sector was seen to have gained most. Those sectors in the west which had a large number of destinations are seen to have gained little overall because their inner areas of Gorgie, Dalry, Merchiston etc., are large source areas. The north-east, Leith in particular, can be seen to have lost substantially from the movement into Local Authority housing. This was to be expected as there have been several large clearance area schemes in the area while the proportion of new Local Authority housing built there has been small.

Although this method has illustrated a degree of bias in the movement into Local Authority housing the differences perceived are somewhat dependent on the positioning of the sectors in the first instance. It was felt that as the most frequent movement was to the areas of the largest housing estates that perhaps it reflected less of a preferred directional bias than one which was produced by the distribution of housing opportunities within the city, i.e. the movement patterns were conditioned more by structure than behaviour.

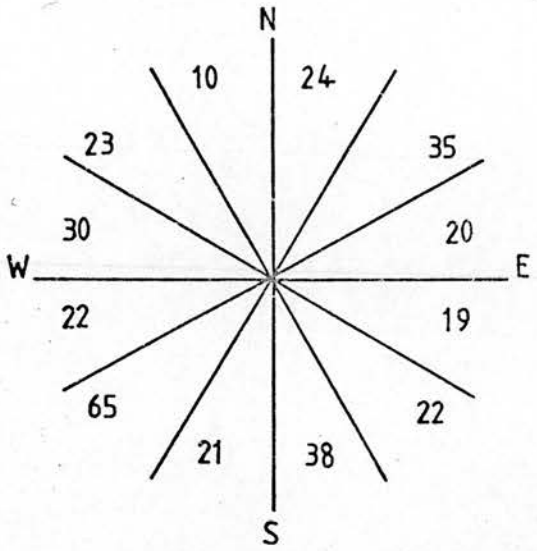
In an attempt to test whether an underlying bias existed apart from any induced by housing opportunities, sixteen sectors were distinguished by combining the 10^{o} sectors in such a way that the numbers of council houses in each group could be estimated (Table 4.14).

This distribution of housing was then compared with the number of moves into each group of sectors to find whether the two distributions were similar. Comparisons were made with moves from private rental, moves from shared accommodation and the two combined. In each case the Kolmogorov-Smirnov test would not permit H_o to be rejected (Appendix 4.11). It was thus concluded that any directional bias present in the movement into Local Authority housing was likely to be due to the distribution of such housing opportunities in the city. This appears to confirm suggestions in the literature (Clark, 1971,1972) where such difficulties were found in a study of Christchurch.

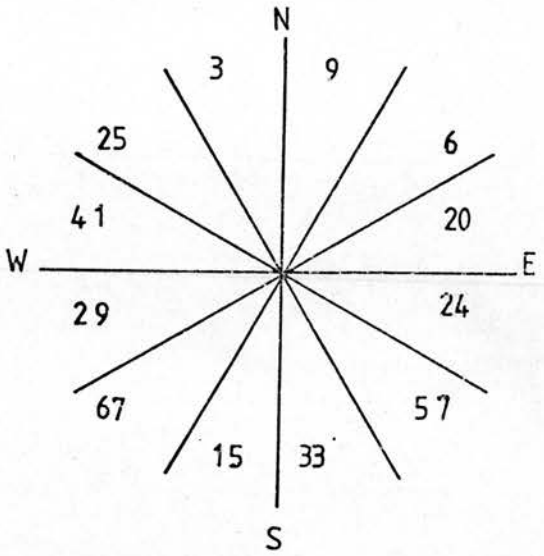
It is possible that a different result may have been obtained if it had been possible to use the proportion of vacancies in each scheme rather than the total housing stock, but unfortunately this was unavailable. Indeed it may have been preferable to use the 'potentially fillable vacancy level' as in some areas e.g. Niddrie, not all vacant houses would be immediately available for habitation. Had either of these been available then it would have been possible to estimate the proportion of vacancies filled by new tenants and thus gauge whether this was substantially greater than expected, thus indicating a preferred directional bias, underlying any induced by housing opportunities alone.

Figure 4.5 Origins and Destinations by 30° Sectors

Number of Origins



Number of Destinations



Balance of Moves

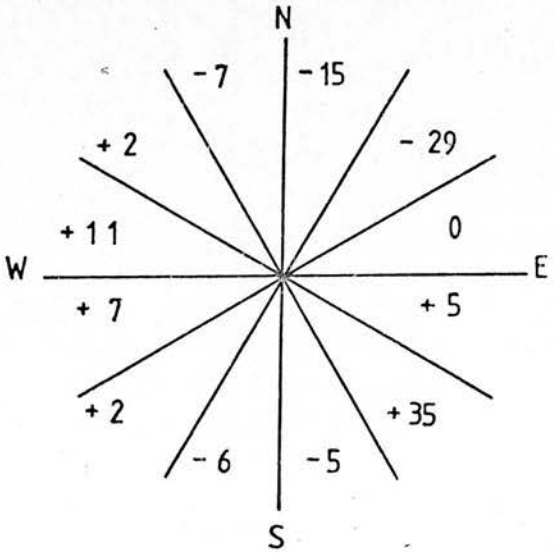
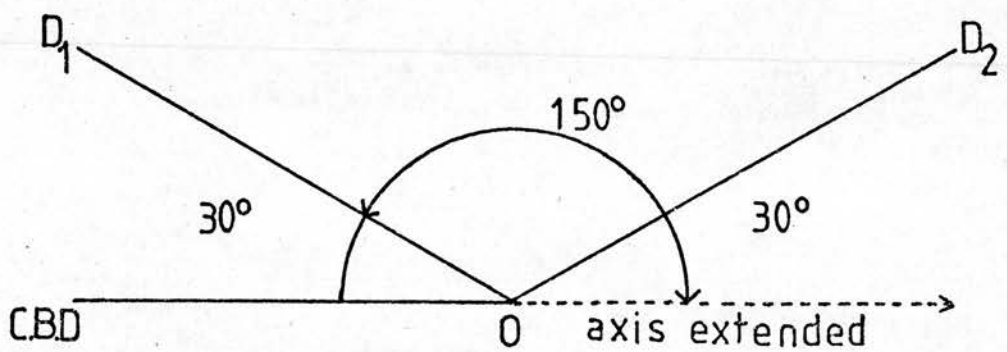


Table 4.13 Origins and Destinations by Sectors

Sector	Origins		Destinations	
	P.R.	SHRD.	P.R.	SHRD.
1	6	-	3	1
2	4	1	9	2
3	3	5	6	3
4	3	6	14	11
5	2	-	11	-
6	8	3	15	6
7	12	6	16	4
8	13	4	10	1
9	1	2	2	-
10	4	-	-	-
11	4	-	-	-
12	10	3	11	4
13	11	-	1	-
14	11	3	3	4
15	25	15	34	25
16	7	6	20	8
17	3	3	1	-
18	2	1	-	-
19	4	2	6	4
20	8	6	3	1
21	-	10	12	15
22	3	8	8	9
23	3	3	1	2
24	3	3	4	1
25	5	-	-	-
26	1	2	-	-
27	2	-	3	-
28	5	1	-	-
29	6	-	5	1
30	10	2	3	-
31	10	3	5	-
32	13	1	-	-
33	6	2	1	-
34	5	-	4	-
35	5	2	6	2
36	4	3	4	2

Figure 4.6

Definition of Sectors with C.B.D Orientation Node



0 - origin

D_1, D_2 - destinations

C.B.D - Central Business District

Table 4.14 Estimates of Numbers of Local Authority Houses in Sectors.

New Sector	Original Sectors	Estimated No. of Houses	No. of Destinations
A	1	334	4
B	2, 3	3,198	20
C	4, 5	5,167	36
D	6, 7	5,281	41
E	8, 9	2,655	14
F	12, 13	1,661	16
G	14	60	7
H	15, 16	12,586	87
I	17, 18	534	1
J	19	2,705	10
K	20	1,388	4
L	21, 22	4,429	45
M	23, 24	5,175	8
N	27	195	3
O	29, 30, 31 32, 33	1,669	15
P	34, 35, 36	3,595	18

Sectoral Bias

The investigation of sectoral bias involved an examination of the moves into Local Authority housing by the two groups of new tenants to find whether there was any tendency to remain within a home sector. It is widely reported in the literature that moves within the city tend to be confined to a sector around the origin, but this is mainly for owner occupied housing. (Adams, 1969; Clark, 1972; Donaldson, 1973) The idea was first put forward by Adams in 1969 when investigating the movements of students' families. He suggested a sectoral bias would occur because he claimed that individuals possess a sectoral mental map of the city and that they would move within this area with which they were most familiar. Later studies have reasonably established that there is a tendency for mental maps to be sectoral in form and that intra-urban moves also form a sectoral pattern. (Donaldson, 1973; Donaldson and Johnston, 1973).

Donaldson (1973) found that almost two-thirds of the moves which he investigated had destinations within a 30^{o} sector on either side of the C.B.D. axis, while Adams (1969) found that one-third of movement angles were less than 10^{o}. Other studies have been less conclusive. Brown and Holmes (1971) in Cedar Rapids found only a low degree of sectorality, while Whitelaw and Robinson (1972) in Melbourne found marked differences in sectoral bias between socio-economic groups with high status groups

having little sectoral bias. Horton and Reynolds (1971) however,only found a general distance bias and no directional or sectoral biases in their study of mental maps.

The present study makes no attempt to establish the existence or non-existence of sectoral mental maps or to examine their influence on movement patterns. Only the physical pattern of moves is examined here for the existence of sectoral bias; no underlying cause is postulated as no individual interview information is available.

As no computer program or co-ordinate system was readily available such as that used by Brown and Holmes (1971), manual measurement of angles was undertaken. This involved measuring the angles created at the origin of the move when the origin was joined to the C.B.D. and the destination. This gave a distribution of angles of move with the city centre as the orientation node (Table 4.15).

Table 4.15 Distribution of Angle of Move.

	Private Rental	Shared	Total
Mean	96^{o}	83^{o}	92^{o}
Median	87^{o}	85^{o}	87^{o}
Mode	180^{o}	100^{o}	180^{o}

Angles	P.R.	%	SHRD	%	Total	%
$0 - 29^{o}$	32	14.3	16	15.0	48	14.6
$30 - 59^{o}$	32	14.3	23	21.6	55	16.7
$60 - 89^{o}$	51	22.8	16	15.0	67	20.3
$90 - 119^{o}$	24	10.8	26	24.5	50	15.1
$120 - 149^{o}$	26	11.6	12	11.3	38	11.5
$150 - 180^{o}$	58	26.0	13	12.3	71	21.5

Adams (1969) suggested that if moves were sectorally biased there would be a bi-modal distribution of angles and that it should be around 0^{o} and 180^{o} if the movement were towards the centre and the periphery. In the private rental group the peaks in the distribution occur at $60 - 89^{o}$ and at $150 - 180^{o}$, while in the shared group the peaks occur around $30 - 59^{o}$ and $90 - 119^{o}$ which suggests that in both cases there are many lateral moves. Some level of sectoral bias may be seen to be present if a sector of 30^{o} on either side of the origin - C.B.D. axis is taken. If angles between $0 - 29^{o}$ and those between $150 - 180^{o}$ are combined then 40.3% of all moves from private rental and 27.3% of those from shared

accommodation fall into this category. This gives an average of 36.1% of all moves which are less than 30° away from the origin - C.B.D. axis as seen in Figure 4.6. However, in neither case does this provide conclusive evidence of a strong sectoral bias as 59.7% from private rental and 72.7% from shared can thus be termed lateral moves. When the distributions of total move angles, and those for private rental and shared separately, were tested against a theoretical distribution the differences were found not to be statistically significant at the 0.01 level. (Appendix 4.12)

It must be concluded that movement into Local Authority housing in Edinburgh does not exhibit any strong sectoral bias in relation to the C.B.D. as an orientation node. This is contrary to the findings of previous intra-urban movement studies when the flows between owner-occupied dwellings have been examined.

Because the degree of sectoral bias was much less strong in the moves from shared accommodation it was decided to test these for any sectoral bias in relation to a 'commuter axis' as suggested by Whitelaw and Robinson (1972). They put forward the argument that because the C.B.D. had lost some of its focal power in modern cities with the decentralisation of shops and workplaces and the increased mobility of urban residents, that an alternative 'orientation node' might be more realistic. In testing their ideas in Melbourne they found a greater degree of sectoral bias exhibited by

lower socio-economic status residents towards a 'commuter axis'. This linked workplace, origin and destination and they suggested that as the most frequent urban trip was the journey to work that this would influence a person's mental map or activity space to the greatest degree. This still allowed an origin-C.B.D. axis to exist where workplace and C.B.D. coincided.

In the present study workplaces were available for only a percentage of all movers due to limitations in the Local Authority housing records and to the fact that those who were retired, unemployed or worked out of the city were necessarily excluded. This provided seventy out of the one hundred and six movers from shared accommodation (66%) to be tested. The distribution of angles can be seen in Table 4.16. A total of 32.85% of all angles fell within the 30^{o} sectors from the axis which was only 5.5% greater than the number found in relation to the C.B.D. axis. When tested against the distribution of angles from the C.B.D. axis, the difference was found not to be statistically significant. Similarly, when tested against a theoretical distribution and against total move angles there were no significant differences. (Appendix 4.13). As this examination of moves in relation to a commuter axis did not give any results to suggest any stronger sectoral bias this investigation was carried no further.

Table 4.16 Distribution of Angles in 'Commuter Axis'.

Angles	No. of Occurrences	%
0 - 29°	13	18.6
30 - 59°	14	20.0
60 - 89°	16	22.9
90 - 119°	12	17.1
120 - 149°	5	7.1
150 - 180°	10	14.3

Summary and Conclusions

In the construction of a social typology of the city and the subsequent examination of moves between social areas it was found that the approach was severely restricted by the narrow band of social types involved. The majority of movers came from lower socio-economic status areas and as Local Authority housing estates are predominantly classified as such, the destinations of the movers was even more limited. In consequence, the analysis was not extended to perhaps its fullest potential in this direction and the examination of the physical characteristics of the moves and the characteristics of individual household heads was pursued more thoroughly.

It was found that the movers into Local Authority housing were not a uniform group. Initial examination of those involved suggested that a breakdown into movers from private rental and those from shared accommodation would be worthwhile. When this was done it was found that those moving from shared accommodation were

predominantly young household heads, fewer were retired, more were housewives and more gave Family Life-Cycle and Social/Environmental type of reasons for wishing to move. A large proportion, 52%, of those moving from private rental stated that their reasons for wishing to move were Involuntary ones. There was little difference between the two groups in terms of marital status, although a slightly higher proportion of those from shared accommodation were divorced. Socio-economic status varied little between the two groups although a higher proportion from private rental were in skilled occupations. Many of the differences which existed between the two groups could perhaps be related to their differences in age structure.

The spatial patterns of the moves were studied from three aspects i.e. distance, direction and sectoral bias. The overall distribution of distances was found to be bi-modal but this was due to a combination of two skew distributions. Those moving from shared accommodation showed the expected predominance of short distance moves but the movers from private rental presented a negatively skewed distribution with a predominance of medium to long distance moves. This was explained by the relative location of their origins and destinations. Private rental accommodation is almost totally concentrated in the central area of the city while Local Authority housing estates are predominantly peripheral, thus producing a situation where short distance moves are

less likely than those over longer distances. The variation in the distances moved by the two groups was due largely to the fact that those who were sharing dwellings were often already located in the peripheral housing estates.

Directional bias was measured only in terms of gross flows as the conventional measure of such bias was virtually useless here owing to the location of council housing in Edinburgh. Both groups were taken together here as initial tests showed no significant differences between them in terms of direction of movement. There was a strong bias in the total movement with sectors in the west and south-east having particularly large flows into them. When balanced out in terms of origins and destinations the south-east of the city, the estates of Gilmerton, Gracemount and The Inch, gain most movers, while the north-east sectors provide the greatest outflow. This bias may have been a genuine reflection of the desire of new tenants to live in particular areas of the city, but on testing against the amount of council housing in each sector, the similarity of the distributions led to the conclusion that the general orientation of moves was likely to reflect the distribution of housing opportunities in the city and therefore was dependent on structure rather than behaviour.

In testing for any evidence of sectoral bias in the moves it was found that in both groups there was a bi-modal distribution of angles but these were not

strongly indicative of a 'home' sector influence. When the distribution of angles was tested against an expected distribution it was found not to be significantly different. Consequently, any sectoral bias with the C.B.D. as the orientation node had to be dismissed. An alternative axis was tested using work-place as the orientation node but results were no more encouraging. It must be concluded that no such influence exists for those moving into Local Authority housing in Edinburgh. It is probable that the distribution of such housing opportunities within the city is the major influence affecting this factor.

This chapter then has illustrated the types of households who move into the council sector and from where they originate in the city. In the next three chapters those households who are established council tenants will be examined to find how they are able to adjust their housing situations by moving within the local authority housing system either between or within estates. This part of the study involves an examination of the types of households who move, the motivations for moving and the types of areas which are found to be most and least desirable. It is with this last aspect that the next chapter is principally concerned as it is obvious that the types of housing and areas which are available and the way in which these are allocated to tenants are particularly pertinent to the patterns and levels of movement within the council housing system.

CHAPTER 5

LOCAL AUTHORITY HOUSING ESTATES

Introduction

Although the supply of new tenants to the local authority sector and the characteristics of those tenants and the already established council tenants are prime influences on the nature of council housing within the city, other forces also combine to shape the social structure and environmental conditions which are found in Edinburgh's housing estates. These external influences and the consequences of them for spatial and social patterns will be examined here along with the characteristics of the occupants of estates.

Background of Local Authority Housing

Before examining the Local Authority housing in Edinburgh in any detail, it is important to take a brief look at the development of such housing in general terms. Council housing in Scotland began in earnest in 1919 when the first subsidies were given to local authorities by the Government, specifically to promote house building. Prior to this the 'Housing of the Working Classes Act' of 1890 had given the local authorities the power to build houses but had provided no financial assistance. Thus, before 1919 such power had only been used in local acts to provide several small improvement schemes, for example, Tron Square, Bedford Crescent and Portsburgh

Square in Edinburgh. Only after the introduction of state aid did the local authorities begin to employ consistent and direct action to build houses in substantial numbers.

It had been the atrocious conditions which were found by the Royal Commission on Housing in 1917, which led it to conclude that "... the state should therefore accept a direct responsibility for the housing of the working classes in Scotland." (H.M.S.O., 1970 p.10). The ideal proposed by the Commission - "... of a healthy, comfortable dwelling for every family..." (H.M.S.O., 1970, p.10) is the one which has motivated local authorities ever since.

Building was relatively slow at first but over 15,000 houses had been built in Edinburgh by 1939 when the outbreak of war brought house building almost to a standstill. This building by the local authority accounted for 35% of all houses built in the city in this period (Smith, 1964). Immediately after the war things began slowly again with only some 3,000 permanent houses being built by 1949 (Table 5.1). However. 4,000 prefabricated houses were also constructed in this period (Table 5.2), as a quick solution to a desperate housing problem. The 1950's and 1960's saw a tremendous boom in building by the local authority and almost 30,000 houses were completed in this period. This has slowed down in recent years with a relative

easing off in the pressure for new housing and in particular an extreme shortage of building land within the city.

Land Development in Edinburgh by the Local Authority

Local authority land purchases in Edinburgh have been concentrated on the low lying relatively flat areas of the city; for whereas steep undulating sites are favoured by private developers, because they are conducive to attractive estates and fine views, they are avoided by the local authority because of the emphasis on keeping down construction costs (Smith, 1964). Accessibility factors have also been important, particularly in the inter-war years. Inter-war estates tended to be located close to industrial areas because of the problem of access to workplace. Lochend, Prestonfield, Piershill, Granton and West Pilton were all on or near existing tramways and relatively close to the old tenement districts. An exception to this was the Craigmillar scheme which was built on the flat land adjacent to the breweries on the Braid Burn but was two and a half miles from the city centre (Richardson, Vipond and Furbey, 1975).

With only a few exceptions, such as small pockets in the Gorgie-Dalry industrial area, the cheap council housing of this inter-war period was concentrated in the North and East of Edinburgh. However, in terms

Table 5.1 Age of Housing By Estate

Estate	1919-39		1945-49	
	No.	%	No.	%
Wester Hailes	-	-	-	-
Sighthill	-	-	50	2.5
St. Leonards	-	-	-	-
Gilmerton	259	9.0	334	8.6
Craigmillar	697	40.8	-	-
Longstone	52	6.9	-	-
Southhouse	24	2.3	490	47.0
Muirhouse	10	0.3	230	7.9
Leith	624	30.3	4	0.2
Newhaven	-	-	-	-
Niddrie	1886	60.5	-	-
Pilton	346	17.2	1216	60.6
Northfield	436	35.2	-	-
Southfield	-	-	452	22.5
Granton	2370	66.1	-	-
Broomhouse	-	-	-	-
Gracemount	-	-	176	12.9
Oxgangs	28	1.3	-	-
Stenhouse	2299	72.7	-	-
Prestonfield	602	89.2	12	1.8
Portobello	188	66.7	-	-
Lochend	3183	88.8	-	-
Clermiston	80	2.7	-	-
Central	666	71.5	51	5.5
Gorgie	1018	85.6	-	-
Drylaw	-	-	96	7.9
Inch	-	-	-	-
Saughtonhall	524	100.0	-	-
West Mains	-	-	-	-
Juniper Green	44	78.6	-	-
Totals	15,336	29.2%	3,111	5.9%

Source: Housing Registers, Edinburgh Corporation Housing Department, Housing Development, 1973. (updated)

Table 5.1 Age of Housing By Estate (Contd.)

Estate	1950-59		1960-69		1970 +	
	No.	%	No.	%	No.	%
Wester Hailes	-	-	665	16.2	3446	83.8
Sighthill	83	4.2	1722	86.5	136	6.8
St. Leonards	182	27.5	61	9.2	419	63.3
Gilmerton	1205	31.1	1975	50.7	96	2.5
Craigmillar	-	-	1012	59.2	-	-
Longstone	201	26.8	376	50.1	122	16.2
Southhouse	41	3.9	486	46.7	-	-
Muirhouse	1453	49.9	1219	41.9	-	-
Leith	267	12.9	1162	56.5	-	-
Newhaven	117	45.2	124	47.9	18	6.9
Niddrie	643	20.6	172	5.5	417	13.4
Pilton	239	11.9	207	10.3	-	-
Northfield	298	24.1	504	40.7	-	-
Southfield	1226	60.9	335	16.6	-	-
Granton	-	-	1216	33.9	-	-
Broomhouse	970	94.9	52	5.1	-	-
Gracemount	552	40.8	626	46.2	-	-
Oxgangs	1521	72.0	563	26.7	-	-
Stenhouse	645	20.4	218	6.9	-	-
Prestonfield	-	-	61	9.0	-	-
Portobello	-	-	94	33.3	-	-
Lochend	78	2.2	322	8.9	-	-
Clermiston	1791	60.8	955	32.4	120	4.1
Central	-	-	176	18.9	38	4.1
Gorgie	158	13.3	13	1.1	-	-
Drylaw	1107	92.1	-	-	-	-
Inch	1743	100.0	-	-	-	-
Saughtonhall	-	-	-	-	-	-
West Mains	417	100.0	-	-	-	-
Juniper Green	6	10.7	6	10.7	-	-
Totals	14,943	28.4%	14,322	27.3%	4,812	9.2%

Source: Housing Registers, Edinburgh Corporation Housing Department, Housing Development, 1973. (updated)

Table 5.2 Prefabricated Houses in Edinburgh

Area	Number	Date Built (Completed)
Brunstane	16	7.11.46
Crewe Road North	38	25. 7.46
Coillesdene	69	8. 5.47
Craigmillar 1	41	5. 9.46
Craigmillar 2	48	25. 4.47
Craigmillar 3	267	24. 3.48
Colinton Mains	123	17. 6.48
Drylaw Mains North	200	28. 5.48
Ferniehill	233	16. 4.45
Hyvots Bank	226	18. 2.49
Longstone South	218	3. 4.48
Longstone North	135	21. 5.48
Muirhouse	193	30. 5.46
Moredun	565	27.10.48
Northfield	229	13. 9.48
Sighthill	537	30. 9.47
Southfield	100	10.10.46
Southhouse	240	11. 3.49
Saughton Mains	158	6. 8.48
West Pilton	364	27. 5.47
Total	4,000	

of area, most of the land acquired by the Corporation was in the West and North-west of the city, for example, Pilton, Stenhouse, Saughton Mains, Chesser, Hutchison, Saughtonhall and Sighthill, This western expansion originated close to the central congested tenement areas from which the population was moved out. There was little competition for land within these sectors and the Corporation was able to buy up whole farms and thus acquire large tracts for future use. In the 1930's land was also bought east of Cramond on the coast and at Drylaw. Most of these sites, but not all, were reserved for a higher quality council housing for working class and lower middle class (non-manual) families who could afford to pay higher rents and higher fares on the public transport system. The limited amount of superior council housing east of the city centre was confined largely to the early development at Willowbrae near Holyrood Park (Richardson et.al., 1975).

After 1945 the local authority was the dominant housing supplier in the city because it was able to dominate the land market which was characterized by an extreme shortage. Of over 38,600 houses built between 1945 and 1966 almost 26,000 were local authority (Richardson et.al., 1975). Even so, it must be remembered that owner occupation is more prevalent in Edinburgh than in other Scottish cities, due primarily to the marked stability of the Edinburgh economy plus the high status, service dominated economic structure.

Since the war there have been no Corporation land purchases within one and three-quarter miles of the centre or beyond four and a half miles from it. About 50% of the total was in the three to four mile band and almost 60% of these have been in the West and South-east of the city (Richardson, Vipond and Furbey, 1974). Land purchases in the North-west and North-east areas have been few because they are bounded by the Forth and the prior development of Granton, Newhaven and Leith in particular, has limited the amount of land available. In the South-east and South-west physical constraints such as the high ground of Arthur's Seat, The Braid Hills and land liable to subsidence have hampered development. Beyond the long established industrial areas the presence of suitable building land accounts for the purchases by the local authority, especially at Wester Hailes. Land purchases have tended to be in clusters to permit development on a large scale, especially of the post-war estates such as Gilmerton, Wester Hailes, Niddrie, Clermiston, Muirhouse and Drylaw.

The overall picture then, is one of large local authority purchases on the low lying areas of the Water of Leith, the lacustrine flats of the West and South-west, the port of Leith and the area North-east and East of Holyrood Park. This has formed the distinct belt of low class housing stretching from the South-west, through the Old Town and spreading out to cover most of the East and North-east of the city. This pattern has been

reinforced by the development of the Sighthill Industrial Estate and the housing estates of Wester Hailes and Broomhouse on the nearby relatively level land. Large sites in the East close to the industrial concentration in Leith and with topography favouring low construction costs were also used for cheap council housing.

The shortage of new sites in Edinburgh is now a major problem as the restrictions imposed by the Green Belt have proved more severe than was foreseen. Redevelopment of the central city too, has been limited partly because of the fine quality, sound construction and historical value of many of the buildings in the Old and New Towns. However, this does afford an excellent opportunity for rehabilitation programmes. All in all housing pressure is bound to increase within the city for, despite an actual fall in population between 1961 and 1971, the number of households is still increasing due to the trend towards a smaller household size. By 1971 the typical Edinburgh household was only three fifths of the average size in 1901 (Richardson et.al. 1975). This poses real problems for housing in Edinburgh in the future.

Building Programme by the Local Authority in Edinburgh

The physical development of the Local authority housing in the city is only one important aspect worthy of examination. It is also important to look at the

legislation and conditions under which different housing schemes were built, for the original motivation for house building and perhaps more importantly, the original occupants of those houses have left a legacy which has had a vital influence on the council estates as they are found today.

The building of local authority housing in the city can be divided into three main phases:

1) inter-war housing for general needs,

2) inter-war housing for slum clearance and overcrowding,

and 3) post-war housing mainly of the 1950's and 1960's.

Inter-War Housing

The first houses built in the inter-war years, under the 1919, 1923 and 1924 Housing Acts, were primarily to provide houses for the working classes in general. While the categorization of "general needs" suggests that anyone might occupy these houses, there were processes of selection which excluded the poorer, less careful or less responsible tenants (H.M.S.O., 1970). The fact that the local authorities were under no real obligation to provide housing for those in the very worst conditions, together with the fact that rents were set at a high level, tended to limit the successful applicants to an exclusive group of skilled working class and lower middle class tenants. In Edinburgh some two and a half thousand houses were built under the 1919 legislation alone, Table 5.3, especially in Leith,

Northfield, Granton (Boswall), Central and Gorgie. The 1923 act made considerable progress in the rehousing of persons from individual insanitary houses or insanitary areas such as the Cowgate, Grassmarket, St.Leonards, Corstorphine and Leith. Under this act 3,397 houses were dealt with and 12,400 persons were transferred to improved accommodation, (Housing Registers, 1973). The majority of the displaced tenants were rehoused in the new housing areas at Lochend and Prestonfield and later at Niddrie[8] but many were rehoused in new or reconstructed blocks of tenements in the Central area.

These first schemes were usually fairly small (Lochend and Stenhouse are exceptional) with mainly around 500 houses and often of cottage type or four flats in a block form. By present standards the facilities are often inadequate and thirty to forty years of wear and tear could have been expected to make these shabby and unpopular schemes. However, despite such drawbacks these schemes are often among the most attractive and have the longest waiting lists, their pleasant appearance and good social character more than compensating for their inferior accommodation. All of these schemes in Edinburgh excepting Niddrie need well above average number of points to obtain housing in them.

Although the design of these schemes was economical, they frequently provide a pleasant, if somewhat monotonous, residential environment, relatively free from noise and

8 Niddrie was not completed until 1935 and received the majority of its first tenants from the later larger slum clearance schemes and cannot be classed as a 'general needs' estate.

Table 5.3 Inter-War Housing by Dates of Acts

Estate	1919-1922	1923-1929	1930-1934	1935-1939
Gilmerton		24(1931)		235(1939)
Craigmillar			120	577(1939)
Longstone	52(1924)			
Southhouse				24
Muirhouse (Davidson's Mains)		10(1929)		
Leith	209	214	89(1931)	112(1939)
Niddrie		1886(1935)		
West Pilton				346(1939/40)
Northfield	310(1928)	126(1928)		
Granton (Boswall)	965 (1922/25)		156	1249(1939) (Mains)
Oxgangs				28(1936)
Stenhouse		2299(1936)		
Prestonfield		538(1928)	64(1931)	
Portobello		26		162(1938)
Lochend/ Restalrig/ Craigentinny		1805(1930)	268(1935)	1110(1935-38)
Clermiston (Corstorphine)	24	40(1930)	8	8
Central	426	58	122	60
Gorgie	619	303	44	52
Saughtonhall		488(1928)		36
Juniper Green				44
Totals	2605	7817	871	4043
	16.98%	50.97%	5.68%	26.36%

The 1919, 1923 and 1924 Acts all embraced general needs, but the 1923 and 1924 Acts also included individual and small area improvement schemes for insanitary housing. The 1930 Act was specifically for slum clearance areas and the 1935 Act extended this to cover overcrowded areas.

The dates given in brackets show the date of completion of the building, where this is known.

accident hazards due to their crescents and cul-de-sacs. However, the good appearance of these schemes seems to arise primarily from the care given and pride taken by successive tenants in their surroundings. The structure and condition of any property can be seen as being broadly dependent on four factors, viz.:

1) the standard of the construction;
2) the age of the property;
3) the level of maintenance; and
4) the quality of the occupants. (Kirkby, 1971).

This last factor was the one which was seen as the most important by the Scottish Housing Advisory Committee when they stated that "We believe that more important than any other factor in contributing to the success of these schemes, was the original selection of tenants." (H.M.S.O., 1970, p. 14). Over the years the high standards of amenity and good reputations created by the first tenants in these schemes have perpetuated themselves to the present day. This certainly seems to be reflected in those schemes in Edinburgh built under these Acts.

Slum Clearance and Overcrowding Rehousing of the 1930's.

In contrast to the 'general needs' schemes, the 1930 and 1935 Housing Acts made a deliberate attempt to allocate houses to those in the most acute housing need. Housing schemes were built purposively to rehouse residents of slum clearance areas and overcrowded districts. The 1930 Slum Clearance Act gave a grant of £2.5 per unit displaced

and rehoused. In two respects these schemes are similar to those of the first group:

1) they are small in comparison with post-war developments, and
2) they are generally within one to two miles of established centres although often lacking shops themselves (H.M.S.O., 1970).

During this phase, however, the architectural quality became increasingly neglected and increased densities accompanied by increased tenement building and larger dwelling units put a greater strain on gardens and back courts, discouraging the growth of trees and shrubs. Some schemes became barren and monotonous areas lacking any apparent amenity. It is difficult to generalise about these schemes; some were good but on the whole they tended to suffer more from poor maintenance by tenants and showed a marked concentration of social problems.

The Scottish Housing Advisory Committee report (H.M.S.O., 1970) again attributes the characteristics of these schemes to their original tenants. Although the 1930 Housing (Scotland) Act specified that a direct transfer of population from slum clearance areas to the new schemes was not necessary, most local authorities in Scotland did concentrate their slum clearance residents in these new schemes. The result in many cases of this tight geographical concentration of those with the lowest social status, has been the development of stigmatized, ghetto areas of low income, low status residents. Many of the first tenants had

been rehoused compulsorily and were neither willing nor financially able to adapt to their new environments (S.D.D., 1974).

These schemes have not all developed in the same direction, some have seen their social problems decline as the scheme has matured, for example, Stenhouse, Lochend, Restalrig, Craigentinny and Granton, but others have unfortunately grown progressively worse in character such as Niddrie and Craigmillar. This latter group in its extreme form now presents the typical picture of physical and social malaise to be found in some areas of most Scottish cities at the present day. None of the dwellings erected in those inter-war schemes have yet reached the limits of their expected life of some 60 years, but often now the standard of accommodation which they provide is below the present acceptable level (Kirkby, 1971). The picture of these problem areas is a universal one - of backcourts strewn with refuse and broken glass, stair windows smashed and eventually never replaced, widespread graffiti and vacant houses boarded up against vandals. All this accompanied by a clustering of social problems such as adult crime, juvenile delinquency, truancy, problem families and child welfare troubles (H.M.S.O., 1970). It is hardly surprising that the local authorities find that they frequently have difficulty in letting this inter-war accommodation. In Edinburgh, Niddrie Mains, Craigmillar and neighbouring Bingham are the areas in which the fewest points are required to obtain rehousing (Table 5.5).

However the local authorities have frequently used these lower standard inter-war dwellings to house problem families and those either unwilling or unable to pay the higher rent of a modern home or to keep them in good condition. Such a policy only serves to exacerbate maintenance problems and accelerate decay. It is evident that many of these inter-war dwellings are functionally and physically obsolescent and indeed many of these schemes were obsolete in terms of their social provision almost as soon as they were conceived (Kirkby, 1971).

In Edinburgh the principal schemes erected under these Acts were at Craigmillar, Niddrie, Granton Mains, Stenhouse, Restalrig and Craigentinny (Table 5.3). The largest single scheme was at Granton Mains and this estate received the bulk of the tenants who were displaced from five clearance areas in the north of the city, namely:

1) Ann Terrace
2) Trafalgar Lane
3) Wilson's Park
4) New and Old Broughton, and
5) Couper Street.

All of these were completed before 1939. They involved 443 occupied houses and a total of 2,530 persons were re-housed (Housing Registers, 1973). Craigmillar received the majority of its new residents from clearance schemes in the Cowgate while those from the High Street tended to be rehoused in Stenhouse. Several other clearance schemes were approved but held up in 1939 with the outbreak of war

and the consequent restrictions on building. These were in the Canongate, Abbeyhill, Lauriston, High Riggs and Leith areas.

Post-War Housing Schemes

The 1939 to 1945 restrictions on house building produced an acute shortage and the various post-war Housing Acts were designed to alleviate the situation by giving inducements to accelerate the building of houses for letting. The 1944 Housing (Temporary Accommodation) Act was passed as a measure to quickly lessen the great shortage of housing. This authorized the Government to provide local authorities with prefabricated temporary houses with an estimated life of ten years. In reality it took twenty years and more to replace almost all these dwellings. In Edinburgh some 4,000 temporary dwellings were erected between 1945 and 1949 (Table 5.2). They were widespread around the city and were replaced between 1965 and 1971 by over 9,000 permanent houses on their original sites.

The building of permanent houses after the war was relatively slow until the 1950s and 1960s when some 14,900 and 14,300 houses respectively were constructed (Table 5.1). The major expansion in post-war local authority housing in Edinburgh took place after the acquisition of new sites in the early 1950s. The shortage of land relative to housing needs , increased flexibility in transport and the ability of people to pay fares were all factors determining

the peripheral location of these post-war sites. The typical location of the post-war council estate in Edinburgh was on the outskirts of the city, often in the spaces between earlier developments which had been located on the main radial routes, for example Colinton Mains, Hyvot's Bank and Muirhouse (Richardson et al., 1975). Although the council estates were still areally distinct, because of their size, the strict spatial segregation of the inter-war years could not be maintained. Perhaps the most outstanding example of this was at Clermiston where the local authority estate was sandwiched between the high status areas of Corstorphine and Barnton. However, it is interesting to note that the private residents in the area had a distinct influence on its form of development (Smith, 1964.)

Similarly, the distinction between general needs and rehousing schemes was not so explicit. The 1935 Act had begun this change by the pooling of all rents into a Housing Revenue Account. However, different council areas were, and are, perceived as varying in status both by tenants and by the Housing Department. The high density flats built in areas such as Muirhouse can be seen as a post-war modern counterpart of the inter-war rehousing schemes (Richardson et al., 1975). Multi-storey housing is a characteristic feature of many post-war schemes particularly those of the 1960s but is not as widespread in Edinburgh as in Glasgow for example. There are 78 multi-storeys in the city all being built between 1956 and

Table 5.4. Multi-Storey Flats in Edinburgh

Estate	Number of M.S. Flats	M.S. as a % of estate's total housing	% of all M.S. in the city.
Wester Halies	1,478	35.95	24.48
Sighthill	777	39.03	12.87
St. Leonards	182	27.49	3.01
Gilmerton	546	14.11	9.04
Craigmillar	286	16.73	4.74
Longstone	-	-	-
Southhouse	-	-	-
Muirhouse	508	17.44	8.41
Leith	896	43.56	14.84
Newhaven	-	-	-
Niddrie	114	3.65	1.89
West Pilton	120	5.97	1.98
Northfield	-	-	-
Southfield	41	2.04	0.68
Granton	-	-	-
Broomhouse	-	-	-
Gracemount	246	18.17	4.07
Oxgangs	240	11.36	3.97
Stenhouse	88	2.78	1.46
Prestonfield	-	-	-
Portobello	31	10.99	0.51
Lochend	322	8.98	5.33
Clermiston	-	-	-
Central	-	-	-
Gorgie	120	10.09	1.98
Drylaw	-	-	-
Inch	-	-	-
Saughtonhall	-	-	-
West Mains	-	-	-
Juniper Green	-	-	-
Maidencraig Court	42	all	0.69

1974. They contain a total of 6,037 units and have approximately 21,000 occupants. The highest block is Martello Court in Muirhouse which has 23 storeys (which is now totally vacated and being sold for private development) and the lowest is Fort House in Leith with 7 storeys. Not all estates have multi-storey flats. Only 16 out of the 30 areas used in the current study have any (Table 5.4). Almost one quarter of all the multi-storeys are in Wester Hailes. Leith rates the second highest total with 14.84% of all in the city with Sighthill, Gilmerton and Muirhouse containing the majority of the remainder. Almost 70% of all the multi-storey blocks in the city are concentrated in the five estates mentioned above. Although Wester Hailes has the largest proportion of any estate in the city they form only 35.95% of that estate's total housing stock, compared with 43.56% of Leith's total council housing and 39.03% of Sighthill's. Multi-storeys are generally unpopular as a form of housing and tend to come last in applicants' choices, but are frequently accepted, particularly by young couples who wish to avoid being passed over on the waiting list. Transfer applications from multi-storeys are generally successful, particulatly after an eight-year tenancy period and those with children under ten years old are awarded three points per child if living higher than the fifth floor in a multi-storey block.

The standard of accommodation in these post-war estates is naturally better than in the inter-war estates

but there are important problems particularly in terms of design and layout. In 1944 the Dudley report on the design and layout of dwellings to be built by the local authorities, introduced the 'neighbourhood concept'. This advocated the development of residential estates to house up to 10,000 people and to form a socially balanced community, each with its own centre complete with church, community centre, schools, shops, play areas and youth centres. However admirable these ideas were, in practice it has been very difficult to achieve. As the building programme got under way the three and four storey walk-up flats which had been adopted during the 1930s to give higher densities and lower costs, became almost universal. This building type reproduced time and again formed the great post-war estates which were both larger than any before and farther from the city centre. This has not been as problematic in Edinburgh as in the Glasgow areas of Drumchapel, Castlemilk and Easterhouse, but can be seen on a much smaller scale in Gilmerton, Oxgangs, Broomhouse, Sighthill and Wester Hailes. The plans for commercial and social facilities on an increased scale were often never implemented due to the overriding importance of building houses as quickly as possible. This low priority for community facilities is not the only problem. The lack of parking spaces and childrens' play areas is as serious as in the inter-war estates. The open space which was so desired by the occupants of the old tenements was provided but has been so misused that its condition is one of the worst

features of these estates.

Some schemes have settled down as children have grown up and as facilities have been introduced, but others have serious problems. The years of deprivation have produced widespread apathy among the majority of tenants and often violent protest among a minority of the young people. As these schemes are expected to have a future life of 30 to 50 years, action will be necessary to rescue them before deterioration goes too far.

On the whole in Edinburgh the problems are not at their very worst, although some notable exceptions are found. Craigmillar and Niddrie exhibit some of the worst features of the inter-war rehousing schemes, while West Pilton, Drylaw and Muirhouse among others illustrate the problems of the large monotonous post-war schemes. Indeed even the local authority's most recent development at Wester Hailes can be criticized not only for its size, isolation and lack of community, social and commercial facilities but in terms of its poor construction, with bad sound insulation and condensation being among the foremost of the problems.

Administration of Estates

Although estates may be affected by their original occupants, the onus of selecting these occupants lies with the local authority and as such, housing management must be seen to exercise a very important influence on the character of all the housing estates in the city. It is

not entirely chance which determines the communities being formed on these estates. Effective discrimination on the part of the applicant and discretion on the part of the local authority housing managers, usually work in the same way to confirm a scheme in the general direction which it has already taken. Where schemes tend towards one extreme or another the exercise of preferences strongly reinforces this trend. At the upper end of the scale the discriminating applicant who wishes only to accept a house in one or two congenial schemes, and whose suitability for such a good scheme may be confirmed by a housing visitor's report will be allowed to wait and satisfy his preference. On the other hand the desperate family, often homeless or badly overcrowded will be placed in a scheme of a lower category with a shorter waiting list, with houses which may be difficult to let. Between these extremes tenants will tend to find their own level. Access to popular districts is closely regulated by the ability or willingness to wait and this inevitably favours certain groups, such as transfer tenants. In Edinburgh six points are added to an applicant's total points merely for waiting one year. In Dundee too it has been seen that in terms of waiting time 'very popular' districts cost six or seven times the amount of time needed to gain access to a 'very unpopular' district (H.M.S.O., 1976).

This type of selection process is preceded by an even more important one, for as the price mechanism has been removed in local authority housing, other ways of sharing

the limited supply must be found. The initial selection process sifts out those people who are eligible to move into local authority housing from those who are not (Gray, 1976). Local authorities tend to actively discourage certain groups from applying, by their system of awarding points, for example, single persons, lodgers, transients, students and people who have absconded from a previous council tenancy are generally regarded unfavourably as applicants and will be unable to accumulate sufficient points to be awarded a tenancy. This process thus sifts applicants but frequently they are sifted again by the imposition of residence qualifications. In Edinburgh admission to the housing list is dependent upon being employed or living within the city with the exception of aged persons with family ties in the city who may also apply (Letting Regulations, Appendix 5.6).

Once a household has been accepted as an applicant it joins the waiting list and its exact position is determined by the number of points which it accumulates. This should be a true reflection of the household's need for rehousing. Within the waiting list, however, there are several sub-sections which determine the order in which applicants are allocated dwellings, viz.:

1) medical priorities

2) clearance and closing order victims, and

3) those applicants with ordinary points.

Even within these three sub-sections allocation will be made in (1) by the date of the award; in (2) by the date

of the closing order and the length of stay in the area and in (3) allocations will normally be made purely on the basis of the number of points which are held. Within these general groups too there is a system of queuing and sub-queuing for specific demands such as different-sized houses, different types of dwellings and most importantly for different estates. Because of this system, those families who have very pressing housing problems and cannot afford to wait will be unable to obtain housing in the most popular areas and often will be forced to accept low-status housing in poor condition and in unpopular estates. The converse applies to others, particularly transfer tenants, who as they tend to be in better housing situations, can afford to wait longer, accumulate more points and thus be better able to choose their housing and their estate. In a study of Hull (Gray, 1976) it was found that those tenants who were assessed as low status by the local authority were the most likely to occupy pre-war housing of low rateable value. In Edinburgh, as will be seen in more detail later, the household heads of inter-war housing tend to be of lower socio-economic status than those in post-war housing (Appendix 5.3). Edinburgh Corporation Housing Department do not admit any policy of confining problem tenants to specific areas but they do admit to a process of selection for areas and particularly for new houses. If anything detrimental is found during the housing visitor's interviews, such as dirty housing conditions or anti-social behaviour, the

Housing Department reserve the right to refuse housing in a specific area or in a new house. Consequently, although an applicant may reach the top of his particular queue, he may not be allocated a house in the area of his choice if he is felt to be undesirable or in some way unsuitable for that particular estate.

The Demand for Estates

When householders apply for rehousing they are advised by the Housing Department as to which areas they are most likely to be allocated in the near future. Some estates are virtually impossible to get into unless a medical priority, a closing order or a clearance area qualification is held due to their relative popularity compared to others. The Housing Department do not actively rank estates in status or popularity terms but in reality such a ranking does exist. This ranking is due entirely to the supply and demand situation. When there are a number of households waiting for an area or a specific type or size of house in an area it is the household with the greatest number of points which will be allocated a house first. Thus it is this household and others around the top of the list who determine how many points are necessary to obtain a house in any area. Thus if those households with medical priorities wish to wait to be rehoused in a particular area, then at that instance in time only those people with similarly high numbers of points will have any chance of also being rehoused in that area. Similarly, as some

estates are greatly in demand due to nearby clearance schemes, such as those around Leith, they are virtually impossible to get into on an ordinary points basis, e.g. Portobello and Coillesdene. Table 5.5 illustrates the situation for a particular point in time, although this is unlikely to change greatly through time. This tabulation is drawn up by the Housing Department on a periodic basis to assist them in advising applicants of the likelihood of achieving their choice of area and/or size and type of house. In general it can be seen that very high points are needed for two apartment houses in almost all areas, excepting the very unpopular ones. It is also generally accepted that medical and Housing Treatment Area (H.T.A.) priorities are required for ground and first floor flats, maindoor or cottage type accommodation.

To permit a clearer picture to emerge and to allow a ranking of estates in terms of points necessary for entry the points for all sizes and types of dwelling were averaged out and each of the 55 housing areas was thus allocated a single figure of the number of points necessary to be rehoused in that area (Table 5.6). The scores for each area were computed using the arbitrary total points of 300, for a H.T.A. priority or a Closing Order (C.O.) and 400 for a medical priority as the highest ordinary points needed reached a total of 266 (Juniper Green, 3 apts.), Table 5.5. The awarding of points in this way was to facilitate a numerical ranking of all areas. However,

Table 5.5 Approximate Points for Particular House Sizes, Types and Districts

AREA I					M/S	M/S	M/S	M/S
District	2	3	4	5	2	3	4	5
Chesser	M	CO	CO	CO	-	-	-	-
Hutchison	M	104	CO	-	CC	CO	-	-
Juniper Green	90	266	81	-	-	-	-	-
Longstone	95	83	CO	86	-	-	-	-
Oxgangs	85	99	81	135	-	66	-	-
Sighthill	CO	78	78	105	72	65	68	
Wester Hailes	74	75	64	61	72	65	-	-
AREA II								
Coillesdene	CO	CO	CO	-	CO	CO	-	-
Craigentinny	CO	81	CO	-	-	-	-	-
Easter Road	CO	CO	-	-	-	-	-	-
Lochend	CO	86	-	-	CO	85	-	-
Meadowfield	CO	80	CO	CO	-	-	-	-
Milton Road	CO	82	76	CO	-	-	-	-
Niddrie Mains	68	57	49	-	-	-	-	-
Niddrie Marischal	72	66	66	95	68	65	-	-
Niddrie Mill	90	71	77	-	-	-	-	-
Northfield	CO	CO	CO	CO	-	-	-	-
Piershill	CO	80	74	-	-	-	-	-
Pilrig	CO	CO	CO	-	CO	CO	-	-
Pirniefield	CO	CO	CO	-	-	-	-	-
Portobello	CO	CO	CO	-	-	-	-	-
Restalrig	CO	CO	CO	-	94	81	-	-
Bingham	72	79	48	52	-	-	-	-
AREA III								
Craigmillar	84	65	50	-	-	67	-	-
Gracemount	143	76	74	76	71	69	-	-
Greendykes	74	68	50	64	69	66	-	-
Hyvots	79	79	81	73	-	-	-	-
The Inch	156	121	79	71	-	-	-	-
Moredun	79	81	CO	88	71	67	-	-
Prestonfield	119	CO	CO	-	-	-	-	-
Southhouse	75	72	66	67	-	-	-	-
West Mains	CO	CO	CO	-	-	-	-	-

AREA IV /

Table 5.5 (Contd)

AREA IV

District							
Broomhouse	CO	90	58	86	-	-	-
	-	-	-	-	-	-	-
Central	CO	CO	CO	CO	CO	76	-
Clermiston	98	82	93	87	-	-	-
Corstorphine	CO	CO	CO	CO	-	-	-
Davidson's Mains	-	CO	CO	-	-	-	-
Drylaw	-	84	86	92	-	-	-
Maidencraig Court	-	-	-	-	82	-	-
Saughtonhall	-	100	-	-	-	-	-
Saughton Mains	CO	90	114	CO	-	-	-
Stenhouse	CO	CO	CO	-	-	-	-
Stockbridge	CO	CO	CO	CO	-	-	-
Westfield Court	-	-	-	-	CO	CO	CO

AREA V

Boswall	-	86	CO	CO	-	-	-
Craighall	CO	CO	-	-	-	-	-
Granton	CO	67	68	-	-	-	-
Leith	CO	CO	98	CO	CO	74	76
Muirhouse	72	65	64	91	69	64	-
Newhaven	CO	CO	CO	CO	-	-	-
Redbraes	CO	CO	-	-	-	-	-
Warriston	-	CO	-	-	-	-	-
West Granton	69	70	67	91	-	-	-
West Pilton	86	62	52	68	69	63	-
Claremont Ct.	CO	CO	-	-	-	-	-

Please note majority of 5 apt. Wester Hailes vacancies are for 6 persons only.
All 4 apt. new houses in Leith are for 5 persons.

CO - closing order or clearance priority

M - medical priority

M/S - multi-storeys

Table 5.6 Minimum Points required to obtain Housing by Areas (Average Points for all types of housing)

1)	Niddrie Mains	58	29)	Lochend	193
2)	Bingham	63	30)	Saughton Mains	201
3)	Greendykes	65	31)	Restalrig	215
4)	Craigmillar	66	32)	Craigentinny	227
5)	West Pilton	67	33)	Boswall	229
6)	Granton	67 (145-100)	34)	Prestonfield	240
7)	Wester Hailes	68	35)	Meadowfield	245
8)	Southhouse	70	36)	Central	263
9)	Muirhouse	71	37)	Hutchison	281
10)	Niddrie Marischal	72	38)=	Coillesdene	300
11)	West Granton	74		Easter Road	300
12)	Moredun	77 (144-100)		Northfield	300
13)	Sighthill	78 (109-100)		Pilrig	300
14)=	Hyvots	78		Pirniefield	300
14)=	Broomhouse	78		Portobello	300
16)	Niddrie Mill	79		West Mains	300
17)	Maidencraig Court	82		Corstorphine	300
18)	Gracemount	85		Davidson's Mains	300
19)	Drylaw	87		Stenhouse	300
20)	Longstone	88 (141-100)		Stockbridge	300
21)	Clermiston	90		Westfield Court	300
22)	Oxgangs	93		Craighall	300
23)	Saughtonhall	100		Newhaven	300
24)	The Inch	107		Redbraes	300
25)	Juniper Green	146		Warriston	300
26)	Piershill	151		Claremont Court	300
27)	Milton Road	189	55)	Chesser	325
28)	Leith	191			

These scores were calculated using the arbitrary points values of 300 for Closing Order (CO) and H.T.A. priorities and 400 for a medical priority. Where the score was substantially altered by the inclusion of a single high priority, the ranking is achieved by omitting this one category.

where the score for an area was substantially altered by the inclusion of a single high priority, the ranking is achieved by the omission of this one category, but noted as in the four areas of Granton, Moredun, Sighthill and Longstone. A further refinement of this ranking system was made to enable a ranking of the 30 areas used here (Table 5.7). This was done again by averaging out the scores of the areas which have been amalgamated in the present study. It is however very interesting to note that in some estates, different parts have different levels of popularity, for example, in Granton the points range from 67 in Granton Mains to 74 in West Granton and to 229 in Boswall; in Niddrie too the range is from 58 in Niddrie Mains to 72 in Niddrie Marischal and to 79 in Niddrie Mill.

Of the ten most unpopular areas, Niddrie Mains, Craigmillar, part of West Pilton and Granton were built as inter-war slum clearance schemes and have retained and often intensified their original stigmas of being low status, low social class areas with a multitude of social problems and present day physical decay of the building fabric and general environment. The areas of Bingham, Southhouse and the parts of West Pilton which were built immediately post-war seem to have been carry-overs from the 1930-35 schemes having similar building types and layouts and as these are spatially contiguous (except Southhouse) with the inter-war schemes, appear to have been unable to maintain a separate identity from them.

Table 5.7 Thirty Study Estates Ranked by Points

1)	Craigmillar	66
2)	West Pilton	67
3)	Wester Hailes	68
4)	Niddrie	69
5)	Southhouse	70
6)	Muirhouse	71
7)	Sighthill	78
8)	Gilmerton	78
9)	Broomhouse	78
10)	Gracemount	85
11)	Drylaw	87
12)	Longstone	88
13)	Clermiston	90
14)	Oxgangs	93
15)	Saughtonhall	100
16)	The Inch	107
17)	Granton	123
18)	Juniper Green	146
19)	Lochend	197
20)	Southfield	199
21)	Prestonfield	240
22)	St. Leonards	263
23)	Central	263
24)	Stenhouse	267
25)	Leith	284
26)	Newhaven	300
27)	Portobello	300
28)	Northfield	300
29)	West Mains	300
30)	Gorgie	303

Similarly, the more recent schemes such as Greendykes, Muirhouse and Niddrie Marischal which were built in the 1950s and 1960s have been unable to maintain their separate identities due to the close association with these stigmatized older parts. It is also worth noting, as was mentioned above, that Muirhouse and West Granton, from their conception, with their high density flats, were viewed by tenants and housing authority alike, as being the post-war equivalents of the inter-war lower status local authority housing (Richardson et al., 1975). Wester Hailes which is grouped with these others is rather a special case, although unfortunately it may tend to develop along similar lines unless care is taken and efforts made to ensure otherwise. Its present low rating is more likely to be due to its relative newness and being an unknown entity in the majority of applicants' minds. The relative surfeit of dwellings in that area too while it was being completed, although now almost wiped out, was a major factor in enabling entry on a low points basis.

The areas which are most poular and consequently those requiring the highest number of points to obtain housing in them, tend to be the areas of old established populations and those inter-war schemes built under the 'general needs' category are found here, i.e. Leith, Northfield, Boswall, Central, Gorgie (Chesser and Hutchison) and Prestonfield. Others such as Stenhouse (including Saughton Mains), Lochend, Restalrig and

and Craigentinny which were built under the 1930-35 acts appear to have developed successfully and overcome any initial problems. Perhaps the strong ties with Leith in the case of the Lochend - Restalrig - Craigentinny areas provided a cohesive influence, but this can only be surmised.

The fact that these areas have long waiting lists tends to reinforce the perceived idea that they are indeed the best estates. The number of applicants for them thus increases and the popularity of a scheme rises disproportionately and this in fact may have little to do with the actual housing in the area.

The social and spatial consequences of these self-imposed and authority imposed selection procedures is to perpetuate images of estates and to segregate the council tenants into status areas. Those streets and estates with good reputations and high status are unlikely to change with other 'suitable' tenants moving in. The corollary is of course that the best tenants are unlikely to be allocated low status property, and the policy, deliberate or not, of low status tenants in low status dwellings has often produced an escalation in social problems and a very rapid disintegration of the physical environment, e.g. as seen in Niddrie, Craigmillar and West Pilton. Once this process has begun it is difficult to reverse since 'respectable' tenants move out and others from better areas or high status new tenants are unwilling to move in. In Hull

(Gray, 1976) the 'dumping' of problem families in two pre-war areas resulted in such substantial deterioration that the estates had to be declared general improvement areas and the majority of tenants moved out to other housing. This appears to have been averted in some of the deteriorating areas in Edinburgh for the moment at least, except perhaps for parts of Niddrie Mains where entire blocks of houses are empty and boarded up. In West Pilton for example, where there were once some 300 vacant houses there are now around only 30 and in Craigmillar with rehabilitation programmes and the emergence of self-help groups, the problems may have been alleviated slightly.

Allocation of Dwellings

Few applicants accept the first house which is offered to them by the Housing Department and it is estimated that for every house let there will be around two and a half refusals of offers. For example, in 1972-73 from 6,769 applicants, 4,252 households were rehoused and the waiting list at the end of the year stood at 6,745. For 10,500 offers of accommodation which were made only 5,205 houses were re-let or let for the first time while 953 tenants obtained transfers and 595 arranged a mutual exchange, (Table 5.8). Whether the lack of satisfaction by applicants comes from being offered a house in an area which is seen as undesirable or because the house type, size or rent

is at variance with their wishes, is not clear. The distribution of house types in particular varies throughout the city and while in general the choice by any applicant will be for detached; semi-detached; terraced; flat; multi-storey flat, many applicants will eventually accept any form of housing rather than be passed over on the waiting list. The great shortage of cottage type accommodation which forms only 12% of the total housing stock in the city, means that few applicants will ever achieve their ambition to live in such a house (Table 5.9). As over 65% of the total local authority housing stock is in the form of flats then it must be realized that the vast majority of council tenants are living in the form of housing in which they would least prefer to live.

When it is realized too that under 3% of the existing stock becomes available for re-letting annually (Cramond, 1964) there seems to be little chance for the majority of tenants to ever achieve their desired form of housing. Existing tenants do fare better than those new applicants, for once the local authority allocate a house it will be on average over 30 years before it will become available for a new family from the waiting list (Cramond, 1964). This does not take account of the interim transfers and exchanges which may take place, so that the average length of time which a tenant spends in a particular house may be much shorter. It does illustrate

Table 5.8 Housing Applications and Lettings 1.2.72 - 31.1.73

Applications During Year		Rehoused During Year	
Homeless	5,098	Homeless	2,975
Closing/Clearance	751	Closing/Clearance	867
Overcrowded	601	Overcrowded	238
Urgent Medical Priorities	154	Urgent Medical Priority	85
Miscellaneous	165	Miscellaneous	87
TOTAL	6,769	TOTAL	4,252

Applications Cancelled during year - 2,294
Waiting List at 1.2.72 - 6,522
Waiting List at 31.1.73 - 6,745

Number of Offers of Accommodation Made		10,500
Number of tenants transferred		953
Number of mutual exchanges		595
Number of tenancies transferred in name only		915
Number of New Houses Let	1,474	
Number of Houses Re-let	3,731	
TOTAL	5,205	

Source: Annual Report of The Housing Committee for year 31.1.73.

Table 5.9 Summary of Local Authority Housing Types and Sizes

Tenements	11,641	22.16% of total
Flats	34,429	65.55% " "
Cottage Type	6,454	12.28% " "
Multi-storey flats	6,037	11.49% of total housing 17.58% of all flats

Size of Housing		% of Total
1 apartment	618	1.18%
2 apartments	8,430	16.05%
3 apartments	30.203	57.50%
4 apartments	11,683	22.24%
5+ apartments	1,590	3.03%

---

that the number of dwellings available for people who do not already live in council houses, is extremely limited. This, taken together with the fact that those who are transfer tenants are more likely to be able to accu mulate a greater number of points, means that the elite housing such as cottage type dwellings are much more likely to go to old established tenants than new applicants from the waiting list. There is a very strong positive correlation (r = +0.92) between the number of transfer tenants in an estate and the number of cottage type dwellings, (Appendix 5.1).

In Dundee a similar pattern was found whereby a much higher proportion of allocations from the waiting list went to flats and multi-storey flats than their proportion in the total housing stock would have suggested, while the pattern for allocations to cottage type property was the reverse (H.M.S.O., 1976). Similarly in Edinburgh there is a strong positive correlation (r = + 0.89) between the number of new, first time local authority tenants and the number of flats in an estate, (Appendix 5.2).

The size of house desired also will regulate the speed of allocation. There is a shortage of 2 and 5 apartment houses in the city, forming 16% and 3% respectively of the total stock. While the problems of under-occupation and with it some of the general shortage in housing could be solved by transferring widows and small families to smaller houses the distinct shortage

of 2 apartment and O.A.P. sheltered accommodation makes this difficult. There are some 9,000 2 apartment, sheltered houses in the city but this is insufficient to accommodate the growing numbers of elderly tenants. Many of these elderly people who are living in houses in which they have brought up their families and where they have lived for a large part of their lives are reluctant to move because of this emotional attachment to house and area. The local authority in general will not force them to move but often with increased rents, high upkeep and heating bills plus the heavy burden of cleaning a large house these elderly persons often find it necessary to apply for a transfer to smaller accommodation anywhere in the city. Such applications are looked on favourably as frequently they can release good sized houses in 'respectable' areas which are much sought after.

Rents, too are becoming increasingly important in determining whether applicants will accept offers of tenancies. The rents do vary around the city, for example, the new estate at Kirkbrae will have rents set at three times the gross annual value (G.A.V.) and in general all new house rents are set at this level. Re-lets are mainly around 2.4 x G.A.V. (figures given in interview in 1976). While applicants in the first instance often accept a tenancy without questioning the rent level, when they subsequently realize how much per week has to be paid requests for transfers are often

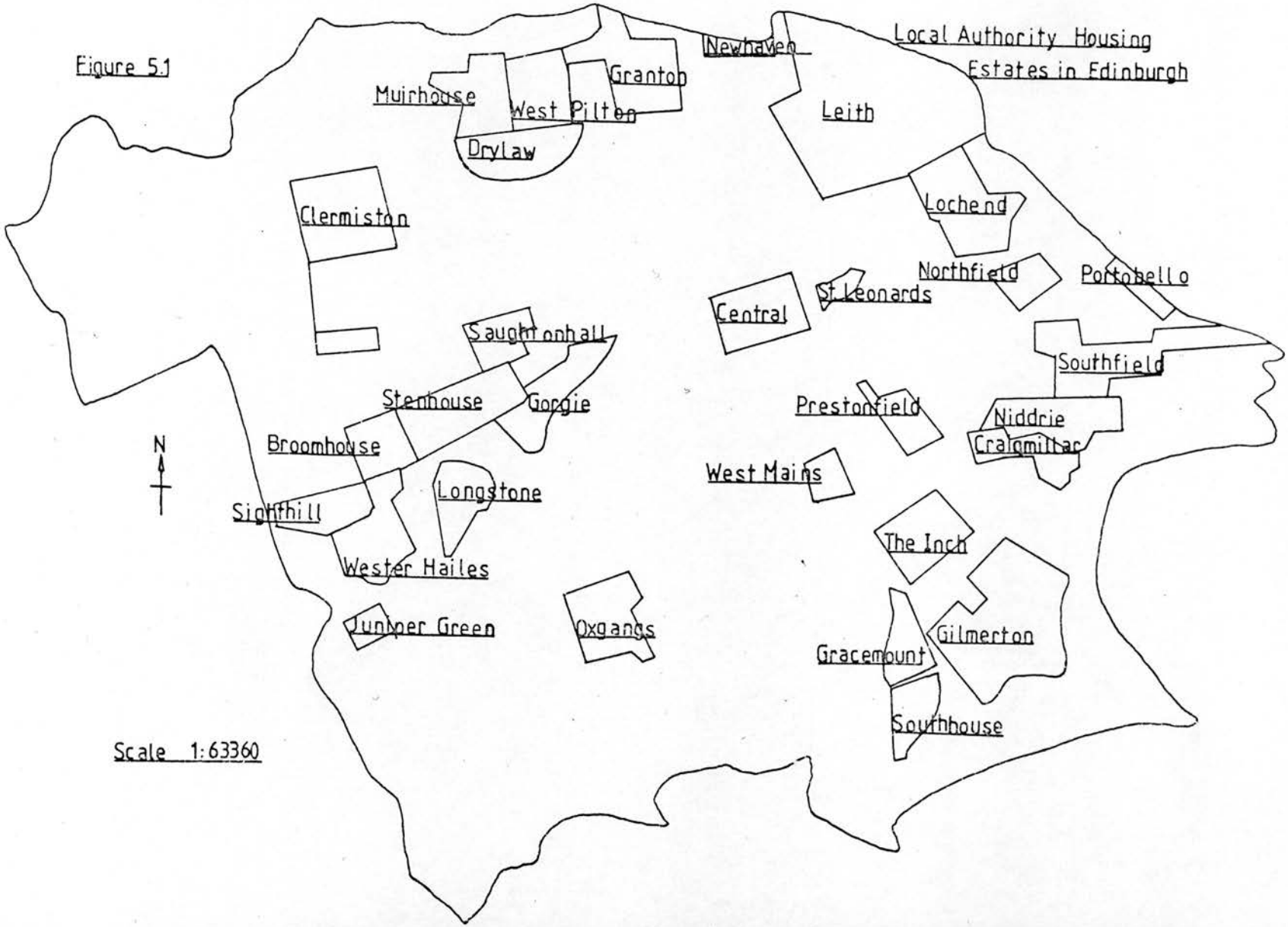
made on the grounds of too high a rent. The initial tenants in Wester Hailes made frequent complaints about the high costs of living there, for not only were the rents very high but high travel costs to the city centre and all electric heating in the houses combined to create an almost impossible financial burden on those living there, (Edinburgh Evening News, 6/6/74.).

Composition of Local Authority Estates in Edinburgh

When all the influences mentioned above are taken into account it is hardly surprising that estates vary not only in their physical attributes but in the characteristics of their occupants. In looking at the composition of individual estates in Edinburgh, 30 areas were distinguished for the present study. This breakdown relies heavily on the 55 housing districts delimited by the Housing Department, (Table 5.5), but combines districts which are spatially contiguous and which are generally referred to as the wider area by applicants, e.g. Niddrie Mains, Niddrie Marischal and Niddrie Mill are all taken as Niddrie. The 30 areas used here are illustrated in Figure 5.1.

As seen above, Tables 5.1 and 5.3, the estates throughout the city have been developed over a period of almost 60 years and while some estates are wholly new, e.g. Wester Hailes, others are predominantly old e.g. Saughtonhall and Gorgie, but the majority have been

Figure 5.1


Local Authority Housing
Estates in Edinburgh
Newhaven
Granton
Muirhouse
West Pilton
Drylaw
Leith
Clermiston
Lochend
Northfield
Portobello
St Leonards
Central
Saughtonhall
Southfield
Stenhouse
Gorgie
Prestonfield
Niddrie
Craigmillar
Broomhouse
West Mains
Longstone
Sighthill
The Inch
Wester Hailes
Juniper Green
Oxgangs
Gilmerton
Gracemount
Southhouse
N
Scale 1:63360

gradually expanded from small beginnings prior to 1939 to their present much larger sizes. Of the total local authority housing stock in Edinburgh, 29% was built in the inter-war period while 28% and 27% were built in the 1950's and 1960's respectively. The vast majority of council housing then is post-war and indeed some 36% of the total has been built in the last two decades.

Not only does the age of housing vary between estates but there is also a variation in the type of dwellings (Table 5.10). Some estates such as Broomhouse, Craigmillar, Sighthill and Wester Hailes are almost entirely flats while others, in particular the inter-war estates, such as Niddrie, Portobello, Granton, Lochend and West Pilton have very high percentages of tenements. Few estates have large numbers of cottage type dwellings but some have more than others, e.g. Southhouse, Stenhouse, Prestonfield, Saughtonhall, West Mains and Juniper Green. The sizes of dwellings are less variable, (Tables 5.9 and 5.11) with the majority being 3 and 4 apartments with a shortage of larger and particularly smaller dwellings.

If the estates are grouped into those which are predominantly post-war and those which are predominantly inter-war, (Table 5.12), it is found that there are many more tenements and many fewer flats than might be expected in the inter-war estates. There thus appears to have been a change of building policy in Edinburgh

Table 5.10 Types of Housing by Estates

Estate	Tenements		Flats		Cottages	
	No.	%	No.	%	No.	%
Wester Hailes	401	9.75	3566	86.74	144	3.50
Sighthill	76	3.82	1907	95.78	8	0.40
St.Leonards	115	17.37	546	82.48	1	0.15
Gilmerton	208	5.38	3221	83.25	440	11.37
Craigmillar	24	1.40	1679	98.24	6.	0.35
Longstone	127	16.91	481	64.05	143	19.04
Southhouse	20	1.92	656	63.02	365	35.06
Muirhouse	1305	44.81	1083	37.19	524	17.99
Leith	306	14.87	1556	75.64	195	9.48
Newhaven	165	63.70	86	33.20	8	3.08
Niddrie	1090	34.96	1850	59.33	178	5.71
West Pilton	1225	61.00	775	38.59	8	0.39
Northfield	195	15.75	807	65.18	236	19.06
Southfield	103	5.12	1628	80.87	283	14.05
Granton	1463	40.79	1989	55.46	134	3.74
Broomhouse	-	-	1022	100.00	-	-
Gracemount	30	2.22	1234	91.14	90	6.65
Oxgangs	42	1.98	1670	79.07	400	18.93
Stenhouse	1339	42.35	654	20.68	1177	37.22
Prestonfield	108	16.00	312	46.22	255	37.77
Portobello	196	69.50	76	26.95	10	3.54
Lochend	1877	52.38	1638	45.72	68	1.89
Clermiston	353	11.98	2084	70.74	509	17.28
Central	107	11.49	658	70.67	166	17.83
Gorgie	3	0.25	992	83.43	192	16.15
Drylaw	286	23.77	769	63.92	148	12.30
The Inch	283	16.24	1071	61.44	389	22.32
Saughtonhall	171	32.63	200	38.16	153	29.19
West Mains	18	4.32	216	51.79	183	43.88
Juniper Green	6	10.71	6	10.71	44	78.57

Source: Housing Registers.

Tenements are defined as blocks of flats at least three storeys high with entrance by a common stair.

Flats include multi-storey blocks, four in a block, maisonettes & others except where sole entrance is by common stair.

Cottages include all houses, semi-detached, detached or terraced with own private entrance and roof.

in the post-war era from tenements to flats. Many of the post-war flats have been multi-storeys with the majority of them being built in the newest estates of Wester Hailes, Sighthill and Leith (Table 5.4). Few of the inter-war estates have much in the way of multi-storey development. Only Niddrie, Stenhouse, Portobello, Lochend and Gorgie have small amounts. Portobello has the largest amount, forming 10.99% of its total housing stock, but this only constitutes 0.51% of the total multi-storey housing in the city. The estates of Leith, Sighthill and Wester Hailes with 43%, 39% and 35% respectively of their total housing in multi-storeys form the greatest concentrations of this form of housing development in Edinburgh. Although there is not a great variation in the size of dwellings in the city as a whole the inter-war estates tend to have smaller housing units than the post-war estates which tend to have many more 4 and 5 apartment houses. The general appearance and something of the environmental conditions in these estates can be seen in the photographs in Figure 5.2.

With these physical differences existing between those estates built inter-war and those built post-war, a brief look at the characteristics of the people living in these estates was carried out. Firstly, age of household head was examined and not unexpectedly it was found that post-war schemes have a higher percentage of young household heads than inter-war

Table 5.11 Sizes of Dwellings by Estate

Estate	Number of Apartments 1	2	3	4	5+
Wester Hailes	-	1107	1895	867	242
Sighthill	-	451	1068	454	18
St.Leonards	6	225	336	82	13
Gilmerton	7	576	1905	1246	135
Craigmillar	-	294	904	490	21
Longstone	-	144	415	188	4
Southhouse	3	130	404	433	71
Muirhouse	28	594	1780	460	50
Leith	146	266	1457	166	22
Newhaven	8	44	189	14	4
Niddrie	49	610	1994	409	56
West Pilton	-	113	696	1084	115
Northfield	22	118	927	235	54
Southfield	20	296	994	604	100
Granton	-	431	2531	571	53
Broomhouse	20	48	92	759	103
Gracemount	74	204	653	340	83
Oxgangs	24	253	1390	413	32
Stenhouse	14	415	2204	499	38
Prestonfield	-	209	436	28	2
Portobello	-	29	120	131	2
Lochend	28	677	2683	195	-
Clermiston	30	359	1739	721	87
Central	43	490	300	88	10
Gorgie	27	190	783	134	55
Drylaw	-	39	725	366	73
The Inch	69	106	804	617	147
Saughtonhall	-	-	524	-	-
West Mains	-	6	340	71	-
Juniper Green	-	6	32	18	-

Table 5.12 Inter-War and Post-War Estates

Inter-war Estates (Over 50% of the housing stock built in 1919-1939).	Post-war Estates (Over 50% of the housing stock built after 1945).
Niddrie	Wester Hailes
Granton	Sighthill
Stenhouse	St.Leonards
Portobello	Gilmerton
Lochend	Craigmillar
Central	Longstone
Gorgie	Southhouse
Saughtonhall	Muirhouse
Prestonfield	Leith
Juniper Green	Newhaven
	West Pilton
	Northfield
	Southfield
	Broomhouse
	Gracemount
	Oxgangs
	Clermiston
	Drylaw
	The Inch
	West Mains

schemes (Table 5.13). The variation was tested by Kolmogorov-Smirnov and was found to be significant at the 0.01 level (Appendix 5.3). However this was partly a reflection of the fact that the older established schemes have retained many of their original tenants and that the occupants have grown old with the estate rather than older household heads being allocated to older estates. When the number of movers and non-movers for these two groups was examined it was found that only 49% of those in inter-war estates were movers (i.e. had moved into their present dwelling between 1963 and 1973) but that there was over 65% who were movers in the post-war estates. This difference was also found to be significant at the 0.01 level (Appendix 5.3). The greatest difference arose from the fact that there were many more non-movers in the inter-war estates than might have been expected from the total population in such housing. The age difference then may be partly attributed to the differences in lengths of time for which estates have been occupied. However later evidence (Chapter 8) will show that there are also biases in allocations to these older estates.

When the socio-economic groups of household-heads were compared between the two groups of estates it was found that those in post-war estates tended to be of a higher S.E.G. than those in the inter-war estates (Appendix 5.3). The main differences were in the proportions in the non-manual, intermediate groups and

Table 5.13 Age of Household Head in Inter-war and Post-war Estates

Age Group	No	%	No	%
15 - 19.9	12	0.70	52	1.33
20 - 24.9	136	7.99	437	11.19
25 - 29.9	171	10.04	624	15.98
30 - 34.9	201	11.80	528	13.52
35 - 39.9	173	10.16	455	11.65
40 - 44.9	155	9.10	422	10.80
45 - 49.9	159	9.34	310	7.94
50 - 54.9	156	9.16	244	6.25
55 - 59.9	135	7.93	252	6.45
60 - 64.9	150	8.81	199	5.09
65 - 69.9	118	6.93	193	4.94
70 +	136	7.99	188	4.81

those in personal service. The proportions of those in skilled and unskilled categories was virtually even.

There are more single and more widowed household heads than might be expected in the inter-war estates but fewer divorcees. The principal difference is between the numbers of widowed householders in the two groups, with 21.74% in inter-war housing and 12.04% in post-war. This is undoubtedly related to the difference in age structure of the two groups.

Of more interest, however, is the fact that almost 46% of all householders living in inter-war schemes had held previous council tenancies, compared with 37% of those in the post-war estates. This suggests that there is some degree of preference for inter-war housing by long term tenants. These inter-war estates tend to be a mixed group comprising both the less popular estates such as Niddrie and Granton and the popular ones of Prestonfield, Stenhouse, Gorgie and Central. This may explain the apparent anomaly of tenants choosing this older housing despite its generally poorer level of amenities. In contrast, there are many fewer tenants from 'shared' accommodation in the inter-war housing, only 12.99% compared with 19.42% in post-war, suggesting that new, first time Local Authority tenants are unlikely to obtain places there.

Differences were also found in the reasons given for moving into council housing by the two groups. Of those in inter-war schemes, fewer than expected gave Social/Environmental or Involuntary reasons. It is likely that the higher

percentage in post-war schemes giving Involuntary reasons, 28% compared with 24% is due to the relatively recent development of clearance areas on a large scale. The higher percentage giving social and environmental reasons, 20% compared to 15% is due to the frequent association of these reasons with people moving from shared accommodation. (All differences were significant at the 0.01 level Appendix 5.3).

These differences have been fairly illuminating but as was seen above, the classification into inter-war and post-war estates is not wholly satisfactory as both groups combine obviously diverse estates. A component analysis of the enumeration districts of the city which contained over 50% of Local Authority housing suggested that the most significant factor in distinguishing one council housing area from another was in terms of demographic structure, in particular, age structure. A table was drawn up using household-head age groups by estates, (Table 5.14), and estates were classified by inspection from this. Estates which could be termed young in age structure terms were picked out. Those estates classed as young had above average numbers of householders who were below 25 years and had a modal class of less than or equal to 25 to 35 years old. Twelve estates were found to fit these requirements, viz.:

1) Wester Hailes
2) Sighthill
3) Gilmerton
4) Craigmillar
5) Southhouse
6) Muirhouse
7) Niddrie
8) West Pilton
9) Granton
10) Gracemount
11) Oxgangs
12) Drylaw

The estates which were classed as old had above average numbers of householders who were over 65 years old and a modal class of over 45 years old. Five estates fitted these requirements, viz;

1) Leith
2) Prestonfield
3) Central
4) Gorgie
5) West Mains.

In the first group only Niddrie and Granton were not classed as post-war estates, while in the second group, Prestonfield, Central and Gorgie were in the inter-war grouping. Illustrations of the housing types in these areas can be seen in Fig. 5.2. Two estates were noted which were mixed, with an above average number of householders over 65 years old and a young modal class. These were Granton and Lochend and such a situation may be due to the fact that they are both large estates with parts being developed at different times and thus may have parts with predominantly different age structures.

In examining the characteristics of these two groups of estates, no significant difference was found in terms of their socio-economic structure, however the old estates have on an average only 2.0% unemployment while the young estates have on average 5.4% unemployed. Not surprisingly, the old estates have an over-representation in the number of widows in them, but

Table 5.14. Age of Household Head by Estates.

Estate	Under 25 yrs		25 - 34.9		35 - 44.9	
	No.	%	No.	%	No.	%
Wester Hailes	115	26.5	133	30.7	61	14.1
Sighthill	52	23.1	61	27.1	39	17.3
St. Leonards	4	4.9	12	14.8	21	25.9
Gilmerton	40	9.1	130	29.7	84	19.1
Craigmillar	25	12.7	54	27.4	39	19.8
Longstone	7	8.6	9	11.1	22	27.1
Southhouse	16	12.5	38	29.4	37	28.7
Muirhouse	64	19.8	103	31.8	59	18.2
Leith	15	6.4	46	19.7	43	18.3
Newhaven	-	-	5	19.2	6	23.1
Niddrie	62	19.3	86	26.7	39	12.1
West Pilton	31	14.0	90	40.6	54	24.4
Northfield	10	7.6	32	24.2	35	26.5
Southfield	15	7.0	60	28.0	59	27.6
Granton	39	10.9	83	23.2	76	21.2
Broomhouse	11	7.8	44	31.2	49	34.7
Gracemount	20	13.0	46	29.9	31	20.1
Oxgangs	23	10.1	66	29.1	48	21.1
Stenhouse	11	3.6	65	21.4	71	23.4
Prestonfield	6	7.1	12	14.3	14	16.7
Portobello	1	3.0	7	21.3	10	30.3
Lochend	21	5.4	88	22.5	66	16.9
Clermiston	20	6.1	99	30.4	90	27.7
Central	3	3.4	5	5.7	6	6.9
Gorgie	5	3.8	15	11.3	30	22.7
Drylaw	12	9.4	47	37.0	31	24.4
The Inch	9	4.7	63	32.8	60	31.2
Saughtonhall	-	-	11	21.1	15	28.9
West Mains	-	-	14	31.2	9	20.0
Juniper Green	-	-	-	-	1	25.0

Table 5.14. Age of Household Head by Estates (contd.)

Estate	45 - 54.9		55 - 64.9		65+ yrs.	
	No.	%	No.	%	No.	%
Wester Hailes	45	10.4	43	9.9	34	7.8
Sighthill	20	8.9	31	13.8	20	8.9
St. Leonards	20	24.7	9	11.1	14	17.3
Gilmerton	80	18.3	58	13.3	41	9.3
Craigmillar	27	13.7	28	14.2	21	10.7
Longstone	14	17.3	10	12.3	17	21.0
Southhouse	10	7.8	15	11.7	12	9.3
Muirhouse	43	13.3	34	10.5	16	5.0
Leith	44	18.8	48	20.5	28	12.0
Newhaven	5	19.2	5	19.2	4	15.4
Niddrie	51	15.9	38	11.8	38	11.8
West Pilton	17	7.7	11	5.0	15	6.8
Northfield	21	15.9	19	14.4	13	9.8
Southfield	29	13.5	20	9.3	30	14.0
Granton	50	14.0	50	14.0	45	12.6
Broomhouse	15	10.7	12	8.5	21	5.7
Gracemount	22	14.3	19	12.3	16	10.3
Oxgangs	36	15.9	27	11.9	24	10.6
Stenhouse	66	21.8	47	15.5	36	11.9
Prestonfield	13	15.5	17	20.3	19	22.6
Portobello	5	15.2	4	12.2	4	12.1
Lochend	63	16.1	68	17.4	65	16.6
Clermiston	46	14.2	40	12.4	26	8.0
Central	22	25.3	30	34.4	23	17.4
Gorgie	37	28.0	19	14.4	23	17.4
Drylaw	13	10.3	12	9.5	7	5.5
The Inch	33	17.2	10	5.2	16	8.3
Saughtonhall	7	13.5	11	21.2	6	11.5
West Mains	14	31.1	-	-	6	13.3
Juniper Green	1	25.0	1	25.0	1	25.0

they also have a higher proportion of single people than could have been expected and fewer married and divorced householders, (Appendix 5.4). The higher numbers of single householders may be related to the fact that in general the old estates tend to have more small dwelling units and fewer large homes than the young estates. A definite consequence of this fact is the marked under-representation of households with 5 or more persons. The old estates are also characterized by having a high proportion of non-movers. On average, in the old estates 52.92% are non-movers while in the young estates the average is only 30.09% and this compares with an average of 45.32% for all estates, (Appendix 5.4).

A particularly interesting difference between the two groups is that in the old estates on average, 44.18% of all householders have held a previous council tenancy. This compares with only 36.73% of those from the young estates and an overall average of 38.85%. When these differences were tested by chi-square they were found to be significant at the 0.01 level, (Appendix 5.4). While the difference in numbers of previous council tenants is important, the greatest proportion of the total difference comes from the under-representation of those from shared accommodation in the old estates. This suggests that new tenants are unable to gain places in these estates which have old established populations. Similarly, it is

interesting to note that on average, 29.46% of those in the old estates gave Involuntary reasons for moving into their present home compared with an average of 21.35% for the young estates and an overall average of 24.77%.

Both these facts point to the real discriminating force between the two groups of estates. The fact that the estates with old established populations have an over-representation of previous local authority tenants and those who have moved for Involuntary reasons suggests that these estates require a high number of points for entry. This tends to exclude new tenants who are often in desperate need of rehousing and favours those who can wait and therefore accumulate more points, e.g. transfer tenants or those who obtain high numbers of points from H.T.A. or C.O. priority.

If the number of points required for entry to these estates is looked at, (Table 5.15) then it can be seen that those young estates are indeed those which require low numbers of points for entry while the old estates require a much higher total. The average number of points needed to obtain a house in a young estate is 79 compared with an average of 278 be rehoused in an old estate.

The fact that age structure is directly reflected in the number of points required to obtain housing in

Table 5.15 Points Required for Entry into 'Young' and 'Old' Estates

Young Estates	Points Required	
Wester Hailes	68	
Sighthill	78	
Gilmerton	78	
Craigmillar	66	
Southhouse	70	
Muirhouse	71	
Niddrie	69	
West Pilton	67	
Granton	123	
Gracemount	85	
Oxgangs	93	
Drylaw	87	Average = 79

Old Estates	Points Required	
Leith	284	
Prestonfield	240	
Central	263	
Gorgie	303	
West Mains	300	Average = 278

an estate shows that the points system is indeed a powerful discriminating agent in local authority housing in Edinburgh, regulating entry into those elite estates to those who can gain the greatest number of points by being able to wait or by obtaining a medical or a H.T.A. priority. Not only do these people obtain housing in better areas but they are also more likely to obtain more desirable housing, for in the old estates 18.18% of the total housing is cottage type dwellings compared with 7.14% in the young estates, (Table 5.16).

As the number of points needed for entry into an estate appears to be of such importance in determining its character, it was felt that a final look at the composition of estates would prove worthwhile if they were broken down into two groups on the basis of their points ratings, (Table 5.7). Ten estates were taken from both the top and the bottom of the rankings, (Table 5.17) and termed popular and unpopular respectively. (Illustrated examples of popular and unpopular estates can be seen in Fig 5.2). The ten popular estates contain on average 18.82% cottage type dwellings compared with the unpopular estates which have an average of only 8.14%. The percentage of flats in popular estates is much lower, at 55.62% compared with 75.35% in the unpopular estates and only 5 out of the 10 have any multi-storeys while 8 of the 10 unpopular estates have this form of

housing, (Table 5.18).

The socio-economic character of the two groups is again relatively constant however unemployment is 1.65% in the popular group and 6.15% in the unpopular one. The proportion of retired household heads also varies with 12.83% and 8.49% respectively. In the popular estates household heads were generally older, although the difference could be attributed to a positive lack of young householders rather than a large over-representation of older age groups, (Appendix 5.5). This supports the idea of a bias within the points system against young householders. Similarly, the greatest variation in terms of previous tenancy arose from the lack of those from shared accommodation in the popular estates, rather than a substantial over-representation of previous local authority tenants. This positive discrimination against new tenants from shared accommodation, rather than against all new tenants, highlights the fact that those who are in desperate need of rehousing and consequently forced to accept offers of tenancies quickly, are unable to accumulate a sufficiently high number of points to get into the better housing areas. Those new tenants who come from private rental accommodation frequently stand a better chance of obtaining higher points from C.O. or H.T.A. priorities. The reasons given for moving substantiate this idea as there are more people than could be

Table 5.16 Types of Housing on 'Young' and 'Old' Estates

Type of Housing	Young Estates		Old Estates	
	No.	%	No.	%
Tenements	6,170	21.56	542	10.29
Flats	20,399	71.29	3,734	70.89
Cottages	2,045	7.14	991	18.81

Table 5.17 Popular and Unpopular Estates by Points Rankings

Popular	Unpopular
Prestonfield	Craigmillar
St.Leonards	West Pilton
Central	Wester Hailes
Stenhouse	Niddrie
Leith	Southhouse
Newhaven	Muirhouse
Portobello	Sighthill
Northfield	Gilmerton
West Mains	Broomhouse
Gorgie	Gracemount

Table 5.18 Types of Housing on Popular and Unpopular Estates

Type of Housing	Popular Estates	Unpopular Estates	All Estates
	%	%	%
Tenements	25.56	16.53	22.16
Flats	55.62	75.35	65.55
Cottages	18.82	8.14	12.28
Multi-storey Flats	9.49	15.10	12.17

(Average for all estates including those with none)

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expected who gave Involuntary reasons in the popular estates, (Appendix 5.5).

Another important difference between the two groups of estates is the large over-representation of widows in the popular estates and the lower number of divorced householders than might have been expected. It is likely that this reflects not only the difference in age structures between the two groups but also the differing ability to wait for the housing of one's choice, and the high numbers of widows from clearance areas with high levels of points. The popular estates thus have an above average percentage of 1 and 2 person households and a below average number of households with 5 or more persons. (All differences were found to be significant at the 0.01 level, Appendix 5.5)..

A popular estate then will be one which has an old established population with few new tenants, especially from shared accommodation. It will be an estate with a substantial proportion of cottage type dwellings and a low proportion of flats, particularly multi-storeys. It is also likely to have a higher percentage of small households and consequently fewer children than unpopular estates. Once an estate has obtained a points rating as popular or unpopular, the image and the social structure of that estate will be reinforced by the working of the points system. Those estates which have good images and which have been

able to develop stable populations will be the ones which continue to be the most popular while those whose original character has been unfavourable and have never been able to maintain a stable core of original or long term tenants are those which will continue to be unpopular. The fact that an estate is unpopular, guarantees that it will continue to be a reception area for many new, first time tenants into the local authority housing sector. This continual arrival of new faces does much in itself to weaken the social networks of any estate and to destroy any feeling of community spirit in the area, (Suttles, 1968).

Summary and Conclusions

It is evident from the examination of the groups of estates above that local authority housing in Edinburgh is far from being uniform. Not only do estates vary in their physicial attributes such as location, size, age of building and sizes of dwellings but their occupants vary in their demographic, social/ and economic characteristics.

The local authority housing in Edinburgh is only one example of the enactment of a country-wide policy of Government subsidized house building. Each city, because it is peculiar in its topography, size and shape manifests a different detailed picture from every other, but the general patterns of development can be seen in every one. The fact that local

authorities have to obtain suitable low cost building land means that often their land purchases and therefore their building, is restricted to the relatively low lying or gently sloping land in the city and in Edinburgh this has produced the dist inctive belt of low-status housing running South-west to North-west.

The various Housing Acts of the inter-war and post-war years have produced similar types of schemes in Edinburgh to those in other Scottish cities. The first estates built by the local authorities under the "general needs" category have, in some ways, been the most successful. These relatively small, well constructed schemes close to the city are still often those which are the most popular and consequently the most difficult in which to obtain housing. In Edinburgh this type is epitomized in Prestonfield, Northfield, Saughtonhall, Gorgie, the Boswall area of Granton and the Central area housing.

The later inter-war building which aimed to relieve the problems of slum and overcrowded areas in the city was generally less successful, although there are exceptions, e.g. Stenhouse. Many of these areas were never able to shake off their initial images of low status, poorly maintained areas and with the increasing years have become more and more the ghetto areas which they were first, rightly or wrongly, believed to be. Craigmillar and Niddrie Mains provide two unfortunate examples of this type of estate in Edinburgh.

Post-war development in Edinburgh never reached the depths of deprivation found in Glasgow, although perhaps due to the city's smaller scale rather than any positive steps taken in a more enlightened direction. There were fewer multi-storey developments and those which were built were never on a large scale. The vast areas of monotonous, uniform three and four storey housing so characteristic of the 1950s were never on a huge scale in Edinburgh, although Muirhouse, Drylaw, Broomhouse, Oxgangs, Southfield and The Inch were all of this era and have their share of monotony, lack of social and community facilities, barren open spaces and boarded up housing. The fact that the local authority sector is smaller in Edinburgh than in other Scottish cities has undoubtedly aided in ameliorating some of the problems of such housing by restricting them to a smaller scale.

In looking at the composition of the local authority estates in Edinburgh, three divisions were made. Firstly, estates were grouped on the basis of their predominant age of building into inter-war and post-war groups. Secondly, they were divided into young and old estates in terms of the age structure of their populations and thirdly, into popular and unpopular in terms of the number of points required for applicants to obtain rehousing in any area.

In the first grouping, it was found that householders in post-war estates tended to be younger, of a higher socio-economic status and more likely to be new first time

council tenants, than those in the inter-war estates. This grouping was however not entirely satisfactory as it combined very diverse estates particularly in the inter-war group by classing together those of 'general needs' and slum clearance categories. In the second grouping where age of householder was used as the discriminating factor it was found that almost all the young estates were post-war estates while three of the five old estates were inter-war. No difference was found in the socio-economic structure of the two groups. It was again found that those in the young estates were less likely to have held previous local authority tenancies.

From this grouping it was evident that neither the age of housing nor age of tenants was the real discriminating factor between estates but that the number of points required for entry to an estate provided the real key to any differentiation. This points rating appears to be a consequence of the physical characteristics of an estate, such as the type of housing, its layout and when it was built and in turn this rating determines the age structure, social and demographic composition of any area.

When ten popular and ten unpopular estates were examined it was found that the popular estates had a higher proportion of cottage type dwellings and a lower proportion of flats (particularly multi-storey flats), than the unpopular estates. Seven of the ten popular estates had over 30% of their housing built in the inter-war period and six of these had the majority of that

housing built under the general needs acts i.e. Prestonfield, Central, Leith, Portobello, Northfield and Gorgie. Stenhouse is the exception of a popular scheme built under the 1930-1935 Acts. The other three, i.e. St. Leonards, Newhaven and West Mains which were built post-war are all very small with only 662, 259 and 417 houses respectively. Not only are they small but St. Leonards and West Mains are relatively central in location while Newhaven is still viewed as a distinctive small fishing community within the city. Indeed eight of the ten popular estates are small (under 1,300 houses) with only Leith and Stenhouse being larger with 2,057 and 3,162 houses respectively. The ten unpopular estates, on the other hand, are larger; none have under 1,000 dwellings and most have over 2,000. All, except Niddrie, are predominantly post-war estates with above average number of flats and below average numbers of cottage type houses.

When the social composition of these estates was looked at it was found that although the socio-economic status was similar, unemployment was almost four times as high in the unpopular estates as in the popular ones. In the popular estates there was a distinct shortage of young household heads and few new first time local authority tenants from shared accommodation. It was felt that all these variations in the social composition of the estates were determined by the number of points required to obtain housing in such areas and the associated ability, or lack of ability to wait for the

housing of one's choice. The points system maintains the differences between estates by ensuring that these elite estates remain areas of older householders with fewer children because, on the whole, they are most able to wait in the queue, accumulating points and choosing where they wish to live. On the other hand the unpopular estates with low points thresholds are likely to remain the areas with high population turnover which receive many new first time tenants and all those who are in desperate housing situations and unable to wait.

This selection process inherent in the points system is perhaps even more important than any exercised by the housing managers in determining the character of different estates. With these differences existing within the local authority housing system in Edinburgh it is obvious that households will attempt to better their housing situations by moving between and within areas. However, as entry into the best housing is severely limited by the points system and by a shortage of vacancies in both the most desirable types of housing and the most desirable areas, much of the movement which occurs must be less than optimal for many households. Nevertheless a considerable amount of mobility does occur within the council sector at both a between and a within estate level. The patterns of mobility and the type of households who move will be examined in the next two chapters, the following chapter dealing specifically with the pattern of moves between estates.

Figure 5.2

5.2 a. Clovenstone Road - Wester Hailes

5.2b. Sighthill Green/Bank - Sighthill

5.2c. Viewcraig Street - St. Leonards

5.2d. Southhouse Broadway - Southhouse

5.2e. Muirhouse Medway - Muirhouse

5.2f. Cables Wynd - Leith

5.2g. Great Michael Rise- Newhaven

5.2h. Wauchope Road- Niddrie Mains

5.2i. West Pilton Circus- West Pilton

5.2j Northfield Broadway- Northfield

5.2k. Broomhouse Way - Broomhouse

5.2l. Fala/Garvald Courts - Gracemount

5.2m Saughton Mains Street-Stenhouse

5.2n. Prestonfield Terrace-Prestonfield

5.2o. Richmond Place - Central

5.2p. Robb's Loan/Chesser Crescent - Gorgie

5.2q. Langton Road -West Mains

CHAPTER 6
MOVEMENT BETWEEN ESTATES

Introduction

The initial step in investigating movement within the Local Authority housing sector involves an examination of the physical pattern of transfers and exchanges between estates. This involves looking at the areal pattern of moves and how this interaction varies with distance between estates, popularity of estates and the results of these patterns if they were to persist through time.

There are two ways in which a household may move within the public housing sector. These are by transfer and by mutual exchange. If a tenant applies for a transfer his housing condition and reason for requesting a move will be examined by the Housing Department and the applicant will be awarded points in accordance with the Letting Regulations (Appendix 5.6). The number of points which are obtained will allocate a priority to the applicant similar to the initial rating awarded when first applying for a place in the council sector. Some tenants will obviously have no recognized need to move and consequently will have little or no hope of securing a transfer unless their circumstances change. These tenants must rely almost entirely on achieving a mutual exchange if they are to fulfil their desire to move, otherwise they may have to wait a very long time to accumulate sufficient points to move.

Exchanges are arranged solely by the tenants and usually involve advertising in local newspapers or shop windows and registering with the Exchange Record held by the Housing Department. In all these cases the onus lies wholly with the tenant to find another tenant, or even two for a three-way exchange, who will be mutually satisfied by the changes of residence involved. Any arranged exchanges must be vetted by the Housing Department to ensure that no breaches in the regulations will occur by the moves, such as overcrowding or underoccupancy and that the tenants involved have good rent records. If nothing untoward is found then the exchange will be allowed to proceed.

These systems undoubtedly favour some tenants more than others. Those tenants in inferior dwellings or less desirable areas but who have no official priority to move may well become 'trapped' for they are likely to experience great difficulty in finding any willing exchangers. This idea of tenants becoming trapped is investigated further in the next chapter.

Movement Between Estates

In examining the movement of households between and within the local authority housing estates in Edinburgh, the basic data used is in the form of a 30 x 30 origin - destination matrix. This matrix by definition includes, as the principal diagonal, those moves within estates. The emphasis in this

section will be on the moves between estates while a more detailed study of within estate movement will be dealt with in the next chapter.

The 30 x 30 origin - destination matrix contains the information on movement between and within the 30 estates which were identified during the data collection and described in Chapter 5. These housing areas are those generally used both by the Housing Department and tenants when referring to a specific part of the city and vary in both areal extent and population size, (Table 6.1). The estates are arranged in this table in descending order according to the percentage of households moving into and within the estate during the study period. The newest estate of Wester Hailes heads the list with other new estates such as Sighthill, St.Leonards and Gilmerton being placed similarly high. Those estates in the lower half of the table are predominantly older and smaller estates in which there is less out movement. Lochend and Clermiston, for example, have low figures even though there was some building during the decade, because the older cores of the estates are predominantly very stable.

A more interesting pattern may be seen from an examination of Table 6.2 which ranks the selected estates in terms of the number of movers out of the area as a percentage of all council housing in that area. A very different picture emerges here with

Table 6.1 Movers and Stayers by Local Authority Estates

Council Area	Number of cases	% of Movers into & within each council area			% of Stayers in each area
		1963-73	1974	Total	1963-74
1. Wester Hailes	389	90.5	9.5	100.0	-
2. Sighthill	198	89.8	5.1	94.9	5.1
3. St.Leonards	74	81.1	4.1	85.2	14.8
4. Gilmerton	384	71.4	3.1	74.5	25.5
5. Craigmillar	167	71.3	7.2	78.5	21.5
6. Longstone	74	70.3	-	70.3	29.7
7. Southhouse	99	69.6	3.0	72.6	27.4
8. Muirhouse	279	67.4	7.5	74.9	25.1
9. Leith	207	59.4	3.3	62.7	37.3
10. Newhaven	27	58.4	-	58.4	41.6
11. Niddrie	289	57.1	6.9	64.0	36.0
12. West Pilton	182	56.0	4.5	60.5	39.5
13. Northfield	114	55.2	1.8	57.0	43.0
14. Southfield	196	54.6	6.1	60.7	39.3
15. Granton	331	53.1	3.6	56.7	43.3
16. Broomhouse	104	51.0	1.9	52.9	47.1
17. Gracemount	131	50.0	3.1	53.1	46.9
18. Oxgangs	204	46.5	3.0	49.5	50.5
19. Stenhouse	286	46.2	2.1	48.3	51.7
20. Prestonfield	67	41.8	3.0	44.8	55.2
21. Portobello	27	40.7	3.8	44.5	55.5
22. Lochend	334	38.9	4.8	43.7	56.3
23. Clermiston	272	37.5	3.7	41.2	58.8
24. Central	84	34.6	2.3	36.9	63.1
25. Gorgie	117	34.1	3.4	37.5	62.5
26. Drylaw	121	32.3	1.6	33.9	66.1
27. The Inch	173	31.2	2.3	33.5	66.5
28. Saughtonhall	50	24.0	2.0	26.0	74.0
29. West Mains	39	20.5	2.6	23.1	76.9
30. Juniper Green	5	20.0	-	20.0	80.0

Table 6.2

Areas Ranked by Movers OUT of Areas (as % of total Council Housing in Area).

Rank	Area	% of Cut Movers
1	Central Edinburgh	78.6
2	West Pilton	47.6
3	Juniper Green	40.0
4	Portobello	29.6
5=	Sighthill	28.3
5=	Southhouse	28.3
7	Craigmillar	26.9
8	Broomhouse	26.0
9	Niddrie	24.2
10	Leith	23.3
11	Longstone	18.9
12	Southfield	18.8
13	Muirhouse	16.1
14	Stenhouse	12.6
15	Gilmerton	12.2
16=	Granton	11.8
16=	Oxgangs	11.8
18	Gracemount	11.5
19	Clermiston	11.0
20	The Inch	8.7
21	Northfield	7.9
22	Drylaw	6.6
23	Gorgie	5.9
24	Saughtonhall	4.0
25	Lochend	3.9
26	Prestonfield	2.9
27	Wester Hailes	2.8
28	St.Leonards	1.4
29=	West Mains	0.0
29=	Newhaven	0.0

Central Edinburgh having the highest percentage of out-movers at 78.6%. This can be explained by the large amount of clearance and closing orders in the area during the period 1963-1973. Similarly, Portobello, Leith and Juniper Green rank high in the table due to the shrinkage of property holdings by the Local Authority in these areas.[9] Those estates which were shown to be less desirable in Chapter 5 are frequently seen to have the highest mobility rates. West Pilton, Southhouse, Craigmillar, Broomhouse and Niddrie in particular stand out. In the lower half of the table the 'more desirable' estates seem to predominate. It is worthwhile noticing also that Wester Hailes and St. Leonards which were ranked first and third respectively in terms of in-movers, are ranked here as twenty-seventh and twenty-eighth. This may reflect the newness of these estates in that the tenants in these areas have had little time to adjust to their circumstances or to have become dissatisfied with their situation. This may also, however, reflect a greater satisfaction with housing in these modern areas or the fact that tenants are likely to be officially well housed and therefore would have difficulty in moving out.

These two tables have given two different measures of mobility in the defined estates but both have been in terms of all moves into or out of the area and have not

9 Juniper Green figures must be seen as unreliable due to the small numbers involved.

singled out the transfers between the thirty estates.[10] Table 6.3 shows the flow into each estate broken down into transfers and new tenants, with the transfers being subdivided into total and those from within each estate. In the majority of estates new tenants form the bulk of movement into the area. These new tenants are those households moving into the public sector directly from other housing sectors irrespective of whether they have held a council tenancy in the past.

Gains and Losses by Transfers

With the analysis of transfers only, it is possible to examine both the moves into and out of an area. This provides an interesting analysis of the estates by highlighting those gaining and those losing by transfers. As transfers account for a relatively small percentage of total moves into an area and as transfer tenants are privileged to some extent as was shown in Chapter 5, then the resulting moves can perhaps be seen as a reflection of the choice of council tenants. Those estates gaining substantially more transfers than they lose could be seen as the more desirable areas. However, it is important to notice here those estates which have been losing a large

10 Both transfers and exchanges will be discussed under the term transfer from here onwards, unless specified, as transfers account for 73% and exchanges only 27% of all the moves between estates.

Table 6.3 Totals by Destinations

Area	Transfers Total in	Transfers Within area	New Tenants	Total Numbers
Wester Hailes	64	8	342	406
Sighthill	49	12	171	220
St. Leonards	12	1	50	62
Gilmerton	146	85	177	323
Craigmillar	61	31	107	168
Longstone	25	8	33	58
Southhouse	30	10	62	92
Muirhouse	70	15	165	235
Leith	42	19	109	151
Newhaven	2	0	12	14
Niddrie	92	46	143	235
West Pilton	51	17	89	140
Northfield	43	10	27	70
Southfield	59	14	76	135
Granton	82	25	142	224
Broomhouse	30	4	31	61
Gracemount	26	9	49	75
Oxgangs	34	15	81	115
Stenhouse	90	27	64	154
Prestonfield	13	1	11	24
Portobello	8	2	8	16
Lochend	42	9	112	154
Clermiston	59	10	69	128
Central Edinburgh	20	5	28	48
Gorgie	26	7	19	45
Drylaw	26	5	17	43
The Inch	36	12	27	63
Saughtonhall	5	0	9	14
West Mains	3	1	6	9
Juniper Green	1	0	0	1

proportion of their housing stock through clearance and closing orders, for example Central Edinburgh and Leith as these could be expected to fare badly. Those with large increases in their stock through new building could conversely be expected to fare better than most such as Wester Hailes and St. Leonards (Tables 6.4 and 6.5).

When those estates which are gaining and losing by transfers are compared with the area's rating in terms of points required for entry (Chapter 5, Table 5.7) it can be seen that there is a degree of correspondence. Of those estates which are losing by transfers, some 54% are rated as unpopular while only 3 (27%) are popular.[11] Similarly, there are more popular estates gaining by transfers than unpopular ones. The only estate to gain substantially by transfers and yet be classed as unpopular is Wester Hailes and as seen above this is a special case. Of three other estates which are unpopular but also gain by transfers, Gilmerton and Muirhouse are also largely newly built with 74% and 77% respectively of their housing stock having been added during the study period. This may suggest that there are two different processes at work in the transfer system, moves to popular estates and moves to new housing.

11 The ten estates requiring the highest number of points for entry are termed popular, the ten requiring the least are unpopular, and the remainder are classed as intermediate.

Table 6.4 Gains and Losses by Transfers

	Areas Gaining by Transfers		Areas Losing by Transfers	
U	Wester Hailes	+45	U Sighthill	-20
P	St. Leonards	+10	U Craigmillar	-14
U	Gilmerton	+10	U Niddrie	-36
	Longstone	+ 2	P Leith	-25
U	Muirhouse	+ 7	U Southhouse	-11
P	Newhaven	+ 2	U West Pilton	-52
P	Northfield	+16	U Broomhouse	- 2
	Southfield	+ 3	Oxgangs	- 5
	Granton	+13	P Portobello	- 5
U	Gracemount	+ 2	P Central	-51
P	Stenhouse	+26	Juniper Green	- 1
P	Prestonfield	+10		
	Lochend	+20		
	Clermiston	+17		
P	Gorgie	+11		
	Drylaw	+13		
	The Inch	+10		
	Saughtonhall	+ 3		
P	West Mains	+ 2		

P popular estates as defined in Chapter 5

U unpopular estates as defined in Chapter 5

Areas Gaining	Areas Losing
Popular (7) 36.8%	Popular (3) 27.3%
Unpopular (4) 21.0%	Unpopular (6) 54.5%
Intermediate (8) 42.1%	Intermediate (2) 18.2%

Table 6.5 Numbers of New Dwellings in Council Areas 1963-73

Area	Number of New Dwellings	% of total Housing Stock
Wester Hailes	4,372	100.0
Sighthill	1,775	97.3
St. Leonards	670	100.0
Gilmerton	1,705	74.1
Craigmillar	1,118	64.0
Longstone	454	61.2
Southhouse	619	63.2
Muirhouse	1,628	77.8
Leith	1,249	74.8
Newhaven	147	75.4
Niddrie	302	10.9
West Pilton	108	4.6
Northfield	310	37.4
Southfield	292	12.3
Granton	1,171	22.6
Broomhouse	48	4.5
Gracemount	228	16.9
Oxgangs	142	8.5
Stenhouse	819	24.1
Prestonfield	61	8.4
Portobello	132	39.5
Lochend	340	9.5
Clermiston	754	27.9
Central	-	-
Gorgie	5	0.4
Drylaw	93	6.7
The Inch	17	0.9
Saughtonhall	-	-
West Mains	-	-
Juniper Green	-	-

When all thirty estates are examined in terms of the flow of transfers, some 54% of all transfers were to areas which required higher points for entry. Of the areas sending transfer tenants to less popular areas, Central Edinburgh and Leith were the greatest contributors, reflecting both their high levels of popularity and their diminishing Local Authority housing stock during the study period (Table 6.6). These findings further substantiate those of the last chapter where it was seen that transfer tenants were more likely to obtain homes in the popular estates than new tenants.

Interaction of Estates

From Table 6.3 and the matrix in Table 6.7 it is evident that a third of transfers are in fact moves within estates. As the estates are not arranged by spatial contiguity any decrease in numbers of transfers away from the principal diagonal does not necessarily illustrate a decrease in the number of moves with increasing distance. However, it is possible to see from the matrix and in particular from the flow chart of moves, Figure 6.1, that the estates seem to interact in particular spatial groupings. There appear to be three main areas of intense interaction with lower levels of interaction between those areas and the rest of the city. The three areas which can be picked out are in the West, the North and the South-east of the city. In the West the estates of Wester Hailes, Sighthill, Broomhouse and Stenhouse in particular have high numbers of transfers between them./

Interaction Between Estates
N
Intra-Estate Transfers
1-19
20-39
40-59
60+
Scale 1:63360

Figure 6.1

Table 6.6 Destination of Transfers by Popularity of Estates

Estate Rating by Points (Lowest rank - least popular)		Destination of Transfers from Estates	
		More Popular	Less Popular
Wester Hailes	3	10	1
Sighthill	7	51	5
St. Leonards	22	0	1
Gilmerton	8	30	18
Craigmillar	1	45	0
Longstone	12	11	3
Southhouse	5	27	1
Muirhouse	6	31	16
Leith	25	3	45
Newhaven	26	0	0
Niddrie	4	47	23
West Pilton	2	83	2
Northfield	28	0	9
Southfield	20	10	16
Granton	17	8	33
Broomhouse	9	12	15
Gracemount	10	6	9
Oxgangs	14	13	11
Stenhouse	24	2	34
Prestonfield	21	0	1
Portobello	27	0	8
Lochend	19	9	4
Clermiston	13	10	19
Central	23	11	55
Gorgie	30	0	7
Drylaw	11	4	4
The Inch	16	2	13
Saughtonhall	15	0	2
West Mains	29	0	0
Juniper Green	18	0	2
		425	357
		54.35%	45.65%

Table 6.7 Origin-Destination Matrix of Transfers

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
1	8	2	1	1	0	0	0	0	0	0	0	1	0	0	0	0	0	2	1	0	0	2	1	0	0	0	0	0	0	0
2	5	12	0	0	0	6	0	0	0	0	0	0	0	0	0	7	0	1	25	0	0	1	9	0	2	0	0	0	0	0
3	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	3	2	0	85	0	1	6	1	2	0	3	3	2	2	0	0	2	0	3	1	0	3	2	0	1	1	8	0	1	0
5	4	0	0	7	31	0	0	2	0	0	13	1	3	5	0	1	0	0	1	1	1	3	0	1	1	0	0	0	1	0
6	1	2	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	2	4	0	0	0	2	0	2	0	0	1	0	0
7	0	1	0	6	1	1	10	0	1	0	0	0	0	1	1	0	7	0	1	1	0	1	1	0	1	1	3	0	0	0
8	2	3	1	1	0	0	0	15	1	0	2	9	1	2	11	0	1	2	1	0	0	0	3	2	0	4	1	0	0	0
9	0	1	2	3	1	0	1	8	19	0	0	2	3	2	8	0	1	0	0	0	0	10	3	0	0	2	1	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	4	1	1	9	15	0	3	3	1	0	46	4	2	12	2	0	1	1	1	4	0	2	2	1	0	0	1	0	0	0
12	6	2	0	3	2	0	0	20	4	2	0	17	1	2	16	4	0	4	3	0	0	1	4	3	0	8	0	0	0	0
13	1	0	0	0	1	0	0	0	0	0	0	0	10	3	0	0	0	0	2	0	0	1	0	1	0	0	0	0	0	0
14	0	2	0	3	6	0	1	0	1	0	9	2	6	14	0	0	0	0	0	1	2	2	1	0	0	0	1	0	0	0
15	3	0	0	2	0	0	1	12	2	0	0	4	1	0	25	0	1	1	2	0	0	2	4	1	0	3	0	0	0	0
16	8	4	0	0	1	1	0	1	0	0	0	1	0	1	0	4	0	0	8	0	0	0	0	1	0	0	0	1	0	0
17	0	0	0	3	1	0	3	0	1	0	2	0	0	0	0	0	9	0	0	0	0	0	1	1	0	0	3	0	0	0
18	2	2	0	1	0	1	0	0	0	0	1	0	0	1	2	1	1	15	2	0	0	1	2	0	4	0	1	1	0	1
19	6	7	1	0	0	3	0	0	1	0	0	0	1	0	0	4	0	1	27	0	0	0	6	0	4	0	1	1	0	0
20	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0	1	0	0	6	0	0	0	0	0	0	2	1	0	0	0	0	0	0	0	0
22	0	0	1	0	1	0	0	0	3	0	1	0	1	3	0	0	0	0	0	0	0	9	1	1	0	0	1	0	0	0
23	7	2	1	2	0	0	0	2	2	0	0	2	0	0	0	1	0	1	5	0	0	0	10	1	1	1	1	1	0	0
24	2	4	3	7	2	0	2	2	4	0	1	2	4	0	9	4	1	2	3	3	0	3	2	5	2	1	3	0	0	0
25	0	0	0	0	0	2	0	0	0	0	1	1	0	0	0	0	0	1	0	0	0	1	1	0	7	0	0	0	0	0
26	0	1	0	1	0	0	0	0	0	0	0	1	0	0	2	1	0	0	0	0	0	0	2	0	0	5	0	0	0	0
27	1	0	0	6	0	0	0	1	0	0	0	0	0	0	0	1	2	0	0	1	0	0	1	2	0	0	12	0	0	0
28	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
30	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Also connected to this system, but less strongly, are Gorgie, Longstone, Clermiston and Oxgangs. In the north the estates of Granton, West Pilton, Muirhouse and Drylaw interact strongly while there are weaker connections to Clermiston, Central Edinburgh and Leith. In the south-east the main movement is between Craigmillar and Niddrie but strong links are also seen between Niddrie and Southfield and Gilmerton. Weaker ties exist between Southfield and Leith and Portobello and between Gilmerton and Central Edinburgh and the other smaller estates in the area.

In general cross-city movement is limited and if the connections with Central Edinburgh were to be omitted the parochial nature of transfer flows would be even more evident. It is rather difficult to be certain of these groupings with a purely visual examination, therefore some type of analysis which would reduce the data to their predominantly underlying pattern was sought. Following Goddard's study of taxi flows in London a principal components analysis was chosen for this purpose (Goddard, 1970).

Principal components analysis is ideal for this type of problem for the single most distinctive characteristic of this procedure is its data reduction capability. Component analysis is a special case of Factor analysis which enables one to distinguish any underlying pattern of relationships which exists, such that the data may be 'reduced' to a smaller set of components which may be taken as source variables accounting for the observed

interrelations in the data. The first principal component may be viewed as the single best summary of linear relationships exhibited in the data. The second component is defined as the second best linear combination of variables accounting for a proportion of the variance not summarized by the first. Since each component is defined as the best linear summary of the variance left in the data after the previous components are removed the first 'm' components, usually many fewer than the number of variables in the set, may explain most of the variance in the data.

The three basic steps in any factor analysis procedure were carried out, viz.:

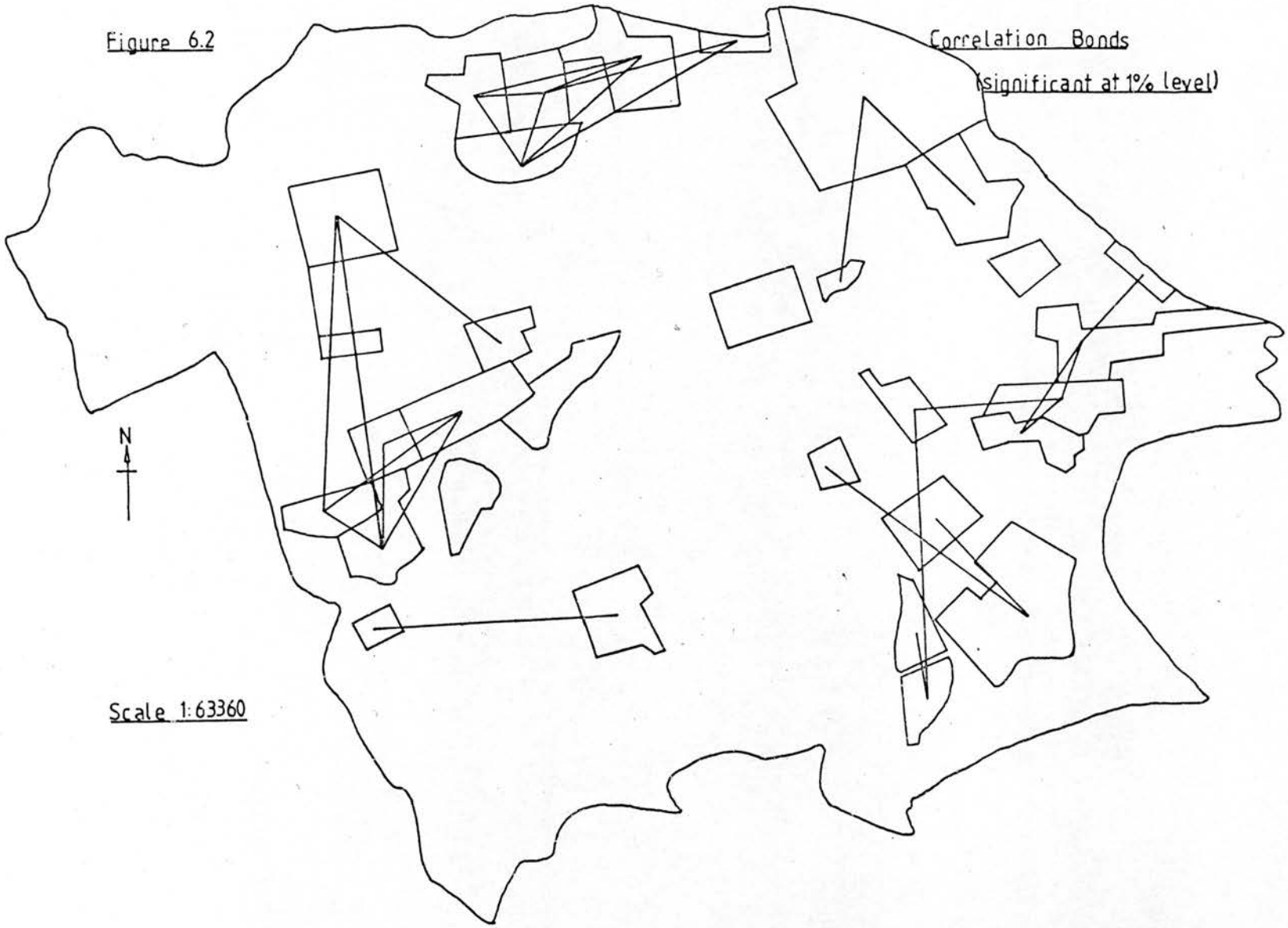
1) the preparation of the matrix,
2) the extraction of the initial factors (components), and
3) the rotation to a final solution.[12]

The analysis was carried out on the 30 x 30 origin-destination matrix where the destinations became the variables and the origins became the observations or cases, over which each of these variables were measured. Two alternative approaches were used in computing the correlation matrix for input into the component analysis. These were:

1) 'R mode' which calculates the correlations between the variables (destinations), and
2) 'Q mode' which calculates the association between individuals or cases (origins).

12 The procedure followed and the program used was that described in Chapter 3.

Figure 6.2



Examinations of the correlation matrix itself proved to be useful in distinguishing important groupings. Already from this it was clear that the groupings which could be vaguely distinguished in Figure 6.1 were being highlighted. Six groups of estates were picked out as being areally distinct with a clearly defined group in the West, comprised of Clermiston, Wester Hailes, Sighthill, Stenhouse, Broomhouse and Saughtonhall. Another group could be seen in the North including Drylaw, Muirhouse, West Pilton, Granton and Newhaven. Other groups were isolated in East/Central and the South-west while the estates in the South-east formed two less clearly defined groups. These correlation bonds were mapped for the 'R mode' analysis, Figure 6.2, and showed areas which tended to receive their in-movers from similar areas. The bonds therefore do not represent actual flows of tenants between estates.

The next stage in disentangling these patterns was to extract ten components in both the R and Q mode analysis with eigenvalue one taken as the cut-off point.[13] As principal components analysis is parsimonious by nature, the first ten rotated components were found to account for 80.1% of the variance in R mode and 80.5% in the Q mode analysis. The components extracted and the variance explained by each is illustrated in Tables 6.8 and 6.9 and Figures 6.3 and 6.4. These components then, in the R mode,

13 The eigenvalue equals the sum of the column of squared loadings for each component.

Table 6.8 Components from 'R mode' Analysis

Component 1 12.1%

Loadings		Scores	
Muirhouse	+.85	Muirhouse	1.83
Newhaven	+.62	Pilton	4.17
Pilton	+.92	Granton	1.80
Granton	+.75		
Drylaw	+.87		

Component 2 12.13%

Loadings		Scores	
Wester Hailes	+.55	Sighthill	3.33
Sighthill	+.88	Stenhouse	2.89
Longstone	+.62	Gorgie	1.06
Broomhouse	+.81		
Stenhouse	+.89		
Gorgie	+.58		

Component 3 8.36%

Loadings		Scores	
Craigmillar	+.84	Craigmillar	2.18
Niddrie	+.92	Niddrie	4.48
Prestonfield	+.75		

Component 4 7.69%

Loadings		Scores	
Gilmerton	+.92	Gilmerton	4.87
Inch	+.65	West Mains	1.37
West Mains	+.84		

Component 5 7.60%

Loadings		Scores	
St. Leonards	+.78	Leith	4.24
		Lochend	1.94
Leith	+.88	Central	1.37
Lochend	+.81		

Component 6 6.93%

Loadings		Scores	
Oxgangs	+.96	Oxgangs	5.14
Juniper Green	+.97		

Component 7 6.74%

Loadings		Scores	
Southhouse	+.76	Southhouse	3.65
Gracemount	+.90	Gracemount	2.92

Component 8 6.52%

Loadings		Scores	
Southfield	+.85	Southfield	4.30
Portobello	+.90	Portobello	2.30

Component 9 6.48%

Loadings		Scores	
Wester Hailes	+.60	Broomhouse	1.60
Clermiston	+.75	Clermiston	3.46

Component 10 5.52%

Loadings		Scores	
Central	+.90	Muirhouse	1.16
		Northfield	1.21
		Central	3.03
		Inch	2.44

Total Explained Variance by ten components 80.08%

Loadings over 0.50 taken as significant

Scores over 1.00 taken as significant

Table 6.8 Contd. Components from 'R & Q mode' Analysis

Variables (Estates)	'R mode' Communality	'Q mode' Communality
1 Wester Hailes	0.85547	0.79887
2 Sighthill	0.91607	0.94871
3 St. Leonards	0.78718	0.72046
4 Gilmerton	0.89922	0.84890
5 Craigmillar	0.80649	0.80590
6 Longstone	0.60022	0.69802
7 Southhouse	0.78066	0.73577
8 Muirhouse	0.80408	0.86447
9 Leith	0.86054	0.84497
10 Newhaven	0.55850	0.64689
11 Niddrie	0.90815	0.78603
12 West Pilton	0.87905	0.72618
13 Northfield	0.32940	0.63904
14 Southfield	0.88505	0.87120
15 Granton	0.66737	0.81631
16 Broomhouse	0.76670	0.92871
17 Gracemount	0.86552	0.87263
18 Oxgangs	0.97881	0.78629
19 Stenhouse	0.84912	0.88948
20 Prestonfield	0.86239	0.87033
21 Portobello	0.87566	0.80963
22 Lochend	0.76692	0.80649
23 Clermiston	0.80931	0.80557
24 Central Edinburgh	0.89725	0.91002
25 Gorgie	0.68027	0.78868
26 Drylaw	0.80856	0.79163
27 The Inch	0.71158	0.68868
28 Saughtonhall	0.64312	0.86690
29 West Mains	0.78813	0.65748
30 Juniper Green	0.96318	0.93076

Table 6.9 Components from 'Q mode' Analysis

Component 1	13.58%			Component 2	11.44%		
Loadings		Scores		Loadings		Scores	
Wester Hailes	+.82	Wester Hailes	4.17	Muirhouse	+.91	Muirhouse	3.70
Longstone	+.50	Clermiston	2.22	Pilton	+.83	Pilton	1.46
Broomhouse	+.67			Granton	+.87	Granton	2.79
Clermiston	+.82			Drylaw	+.69		
Saughtonhall	+.81						
Juniper Gn.	+.80						

Component 3	10.35%			Component 4	9.40%		
Loadings		Scores		Loadings		Scores	
Gilmerton	+.89	Gilmerton	4.67	Craigmillar	+.80	Craigmillar	2.02
Prestonfield	+.90			Niddrie	+.85	Niddrie	3.74
Central	+.58			Southfield	+.87	Southfield	2.38
Inch	+.79			Portobello	+.68		

Component 5	6.43%			Component 6	9.90%		
Loadings		Scores		Loadings		Scores	
Leith	+.85	Leith	2.66	Sighthill	+.87	Sighthill	1.95
Lochend	+.83	Lochend	3.81	Broomhouse	+.64	Stenhouse	4.01
				Stenhouse	+.90	Gorgie	1.49
				Gorgie	+.66		

Component 7	6.27%			Component 8	4.61%		
Loadings		Scores		Loadings		Scores	
Southhouse	+.80	Southhouse	2.74	W. Mains	+.75	Sighthill	3.47
Gracemount	+.92	Gracemount	3.74			W. Mains	2.06

Component 9	4.59%			Component 10	3.93%		
Loadings		Scores		Loadings		Scores	
Oxgangs	+.83	Oxgangs	4.28	Newhaven	+.54	Newhaven	1.71
		Gorgie	1.78	Northf'ld.	+.69		

Total Explained Variance by ten components 80.51%

Loadings over 0.50 taken as significant

Scores over 1.00 taken as significant

distinguish between destinations and group them on the basis of their common origins. To find which areas are the principal origins for each set of destinations the component scores must be examined. As the rotated components are derived from the intercorrelations of thirty variables (destinations) which are measured over thirty observations (origins), by computing each observation's score on each of the components it is possible to determine which areas are the principal destinations for each group.

From Figure 6.3 it can be seen that those areal groupings which were suggested by the mapping of the correlation bonds have been further delineated by the component analysis. The groups of estates in the West and the North have remained virtually the same with the greatest change being seen in the South-east where the estates are no longer loosely grouped together but are now broken down into four smaller, more precise areal groupings. It appears from the map and tables that the groups are markedly self-contained, for when the component scores are examined to reveal the most common origins for each group these are generally found to be estates which are members of the same group.

If the Q mode groupings are examined, the pattern changes quite markedly in some parts of the city. These groupings illustrate estates which send their outgoing tenants to similar areas and again these destinations are frequently within the wider areal groupings. In the North

Figure 6.3

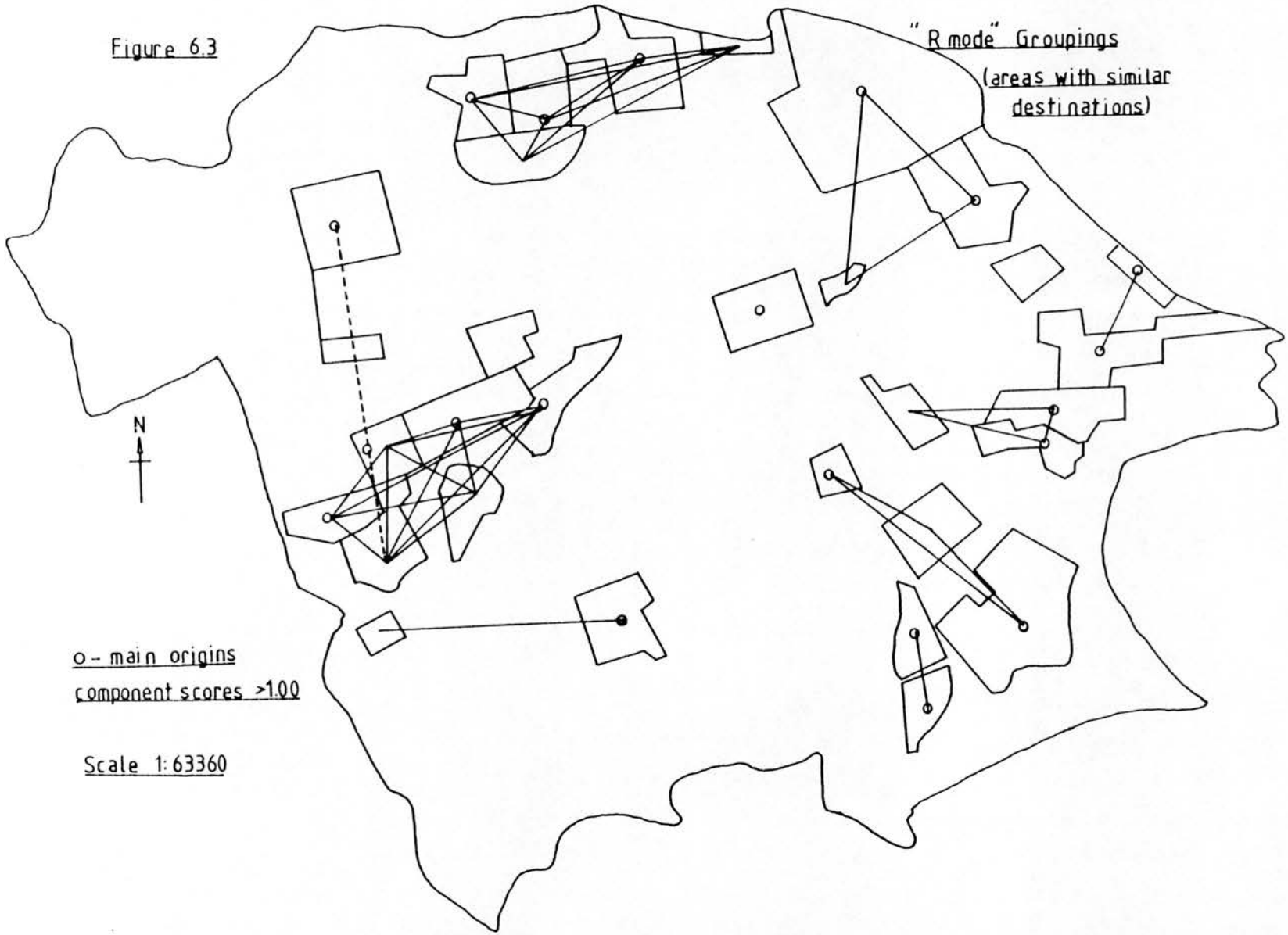
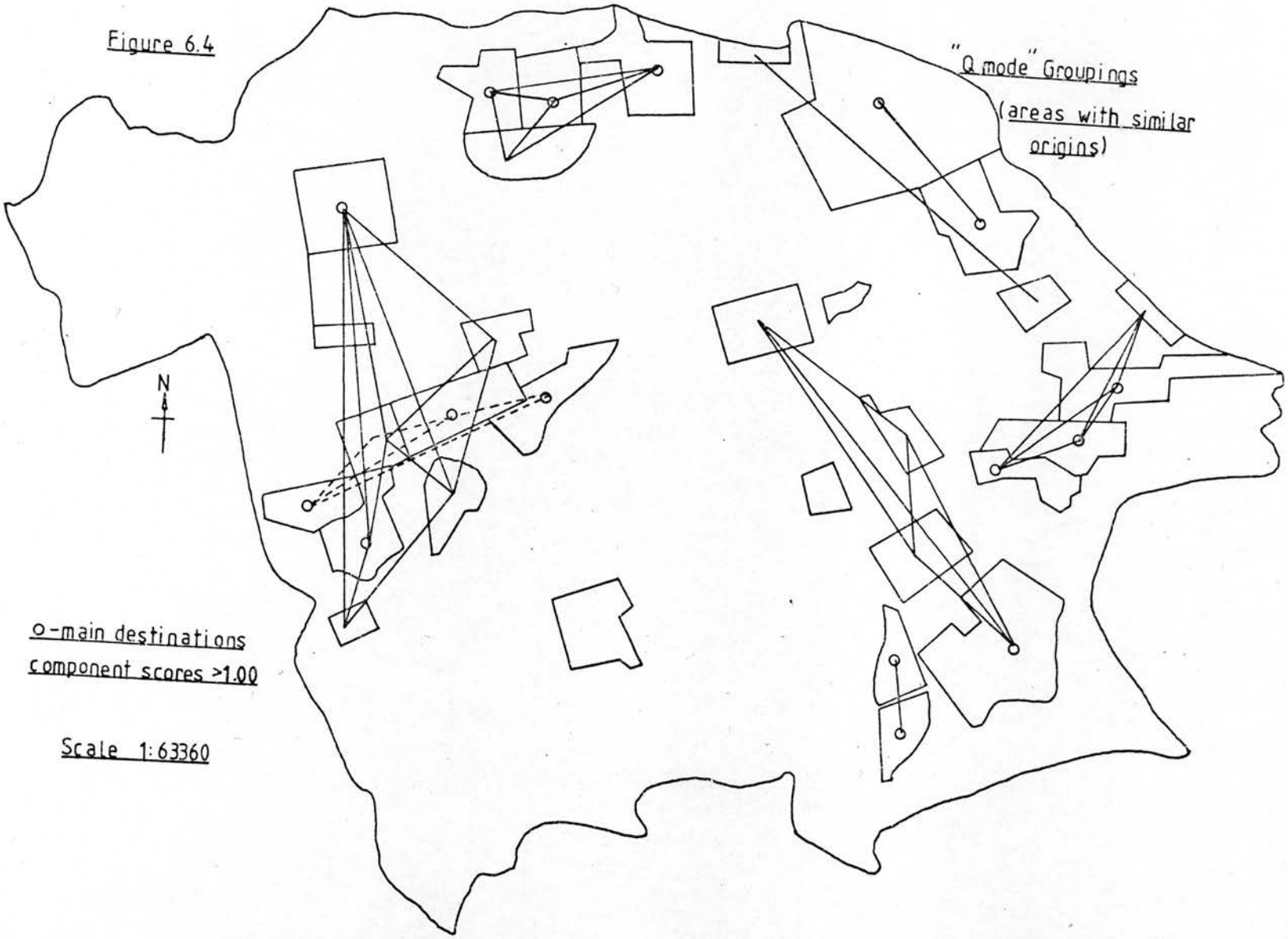

"R mode" Groupings
(areas with similar destinations)
N
o - main origins
component scores >1.00
Scale 1:63360

Figure 6.4


"Q mode" Groupings
(areas with similar origins)
N
o-main destinations
component scores >1.00
Scale 1:63360

of the city the pattern is relatively stable with the four large estates of Muirhouse, West Pilton, Granton and Drylaw forming a tightly interacting group but while Newhaven groups with them as receiving from similar areas, it does not send tenants to these areas. Newhaven links with Northfield in the Q mode analysis but this is probably as much a reflection of the lack of integration of these two small areas in the wider network of transfer flows than any strong similarities in their transfer patterns. (If the communalities are examined then these two estates are seen to be the least involved in the system (Table 6.8)).

In the West of the city two groupings are found for the first time and Broomhouse plays a small role in each. Here it is evident that some estates while acting as receiving areas with one group of destinations, are important origins for a different set of destinations. For example, Wester Hailes, Sighthill, Longstone, Broomhouse, Stenhouse and Gorgie all receive in-movers from Sighthill, Stenhouse and Gorgie and while Sighthill, Stenhouse and Gorgie along with Broomhouse send to these three areas as well as receiving from them, Wester Hailes and Longstone do not.. Wester Hailes, Longstone and Broomhouse along with Clermiston, Saughtonhall and Juniper Green send their out-movers principally to Wester Hailes and Clermiston. Therefore if the specific example of Longstone is examined it can be seen that while the main origins of transfer tenants into Longstone are Sighthill, Stenhouse and Gorgie, the main destinations for those moving out of Longstone

are Wester Hailes and Clermiston. It is difficult to see why Longstone should have this ambivalent pattern of transfers. The points level required for entry into the different areas would not support the idea of a hierarchical movement for Stenhouse (267 pts.) and Gorgie (303) have much higher points levels than Longstone (88) which in turn has similar points levels to Clermiston (90) and higher than Wester Hailes (68). It may be that the pattern reflects a movement out of older housing to newer areas although Clermiston has a similar age structure to Longstone (Chapter 5, Table 5.1). The fact that Longstone has low communality levels in both the R and Q mode analyses may suggest that the estate's role in joining two groups should not be over-emphasized (Table 6.8).

A clearer picture can be seen in the case of Prestonfield. This estate although receiving incomers from similar areas to Craigmillar and Niddrie does not send its out-movers to similar areas. Prestonfield groups with Gilmerton, Central and the Inch in sending its out-movers mainly to Gilmerton. The points levels again do not support the idea of a true hierarchy with tenants moving up the scale from poorer to better estates. Prestonfield (240 pts.) has a much higher points level than Gilmerton (78) although this estate does have a higher points level than Craigmillar (66) or Niddrie (69). As these points levels from Chapter 5 are time specific it may well be that they do not reflect as exact a measurement as necessary in such comparisons. Again there

appears to be a tendency for movement toward newer housing.

Similar variations are found in relation to Portobello, West Mains and Central Edinburgh and it is worth noticing that all these estates with ambivalent positions between groupings are relatively small and therefore have limited numbers involved in their interactions with other estates. The most stable grouping to emerge is that of Southhouse and Gracemount which constantly interact with each other more than other estates. The groups which are defined by this component analysis appear to be highly segregated in space and distinctive by area. This is particularly true of those components (groups) which have high levels of explained variance. These results would tend to suggest that the interaction between estates was in some way related to distance therefore a way to test this was sought.

Regression Analysis of Estate Size and Distance on Interaction between Estates

A multiple regression analysis of interaction with estate size (population) and distance was carried out. The basic concept of regression analysis is to produce a linear combination of independent variables which will correlate as highly as possible with the dependent variable. The regression equation can be used in two ways. Firstly as a prediction equation and secondly to provide an understanding of the relation of each independent variable to the dependent variable. It was used for the latter purpose

Table 6.10 Estates Ranked by Interaction Levels

Rank	Area	Interaction in Number of Transfers
1	Gilmerton	193
2	Niddrie	162
3	West Pilton	136
4	Stenhouse	126
5	Granton	121
6	Muirhouse	115
7	Craigmillar	106
8	Sighthill	105
9	Southfield	96
10	Leith	90
11	Clermiston	89
12	Central Edinburgh	86
13	Wester Hailes	75
14=	Southhouse	58
14=	Oxgangs	58
16	Broomhouse	57
17	Lochend	55
18	Northfield	52
19	The Inch	51
20	Gracemount	41
21	Longstone	39
22	Drylaw	34
23	Gorgie	33
24	Portobello	16
25	Prestonfield	15
26	St. Leonards	13
27	Saughtonhall	7
28=	West Mains	3
28=	Juniper Green	3
30	Newhaven	2
		2037

Interaction here is defined as moves into and moves out of estates but does not include any moves within

Table 6.11 Regression Analysis

Area	% of Explained Variance		
	Distance	Estate Size(population)	Total
Wester Hailes	31.7	19.7	51.5
Sighthill	42.9	7.2	50.1
Gilmerton	35.7	15.4	51.1
Craigmillar	29.2	10.7	39.9
Southhouse	64.0	5.0	69.0
Muirhouse	42.7	14.4	57.1
Leith	20.2	13.7	33.9
Niddrie	63.7	4.7	68.4
West Pilton	51.1	17.2	68.3
Northfield	14.5	4.8	19.3
Southfield	59.7	6.6	66.3
Granton	44.7	11.8	56.5
Broomhouse	50.2	2.4	52.6
Oxgangs	48.2	12.4	60.6
Stenhouse	30.1	12.1	42.2
Lochend	20.3	12.7	33.0
Clermiston	33.8	19.9	53.7
Central	34.6	5.9	40.5
The Inch	5.6	6.8	12.4
For all 30 estates	30.1	12.1	42.2

Note: These results were obtained by using a logarithmic transformation of both dependent and independent variables. This produced the linear equation

$$\log X_{ij} = \pm a \pm b_1 \log(P_i P_j) \pm b_2 \log d_{ij}$$

which represents the gravity model

$$X_{ij} = k \frac{(P_i P_j)^{b_1}}{d_{ij}^{b_2}}$$

(Taylor,1975)

The model was fitted by multiplying together the estate populations, logging the product and then logging the interactions and distances before fitting a multiple regression equation.

A stepwise procedure was used in carrying out the regression. With the exception of one estate, The Inch, distance was always brought into the regression equation before estate size since it was the more powerful explanatory variable.

in this context. An examination of the signs of the regression coefficients indicates a positive or a negative relationship to the dependent variable.

In all cases the regression coefficients indicated a negative relationship between distance and interaction and a positive relationship between estate size and the numbers of transfers.

Estates were ranked by interaction levels with all other estates and a cut-off point of fifty was taken as this provided a natural break in the data and below this the lack of interaction would be likely to have made the results less reliable. Nineteen of the thirty estates were involved in the analysis (Tables 6.10 and 6.11). In all cases but one, The Inch, which has the lowest interaction levels considered, distance explains a greater percentage of the variance than does estate size. The percentage of variance explained by distance ranges from 64.0% for Southhouse down to 5.6% for The Inch. The percentage of the variance in interaction explained by estate size is considerably less ranging from 19.9% for Clermiston to 2.4% for Broomhouse.[14]

From this brief analysis distance would seem to be of importance in explaining the level of interaction between estates and would support the patterns described

14 The program used was SPSS Multiple Regression Analysis package (Nie, Bent and Hull, 1970: Chapter 15, pp. 174-195).

in the other studies which were discussed in Chapter 2. Details of other reasons for the interaction patterns were not investigated at this stage as the reasons given for moving are discussed in detail in Chapter 8. Those reasons cast further light on the pattern of moves between estates.

Markov Chain Analysis

A further way in which the data for moves between estates was investigated was by Markov chain analysis. In a Markov process, movement to any area 'j' is dependent on present location in area 'i'. The probability of moving between these two areas (p_{ij}) is termed the transition probability and the areas are termed states. The probability of moving from state 'i' to state 'j' in one step, p_{ij}, is greater than or equal to zero for all i,j's. The sum of the entries in each row is 1.0, for the states so defined are assumed to include all possible choices for movement. In this case the thirty defined local authority estates provide the universe of choice for transfer tenants. It is possible to compute any nth power of the matrix and this corresponds to the transition probabilities of moving from state 'i' to state 'j' in 'n' time periods or steps.

A Markov Chain in which it is possible to go from every state to every other in a finite number of steps is termed an ergodic Markov Chain. A regular Markov Chain is a subset of an ergodic chain and has only positive entries

for some power of the matrix. For intra-urban migration the chain is generally regular. These regular chains produce several useful descriptive measures. The mean first passage time (MFPT) is the number of steps (i.e. time periods) that it takes for the average household to move from state 'i' to state 'j' for the first time. A matrix of these can be derived and these values are a measure of the "distance" between states. This is a measure of "migrant distance" or "functional distance" for movement rather than spatial distance. Those cells which have zeros in the original origin - distination matrix have large MFPTs.

Another useful property of regular Markov Chains is the equilibrium or limiting matrix, 'E'. This can be used to show the implications of current mobility trends. The 'E' matrix is appraoched as the power of ' P ' (the matrix of transition probabilities) approaches infinity. Every row of 'E' is the same therefore the limiting probability of being in a state 's_j' is independent of the origin state. The row vector of 'E' represents the ultimate distribution of the moving households if the stationarity (i.e. constant transition probabilities) is preserved. Even if the assumed stationarity is not valid the limiting matrix will show a summary of the present tendencies of the process (Simmons; 1974).

Markov Chains then, as was seen in Chapter 2,

appear to provide migration researchers with an ideal tool as their stochastic process accords well with the process of mobility. However, the requirement of a constant probability of transition between states has caused great problems in its use as a predictive tool. The fact that spatial states are frequently difficult to define and even if a city is not growing rapidly, the fact that certain parts may be developing at different rates, makes for an instability which tends to alter the relationship between states thus affecting the transition probabilities.

Despite this flaw, Markov Chains have been used quite widely as descriptive rather than predictive tools in the analysis of population movement. Studies have examined movement between physical states such as cities or administrative areas (Compton;1969), between social states (Brown and Longbrake;1970) and within urban areas (Truelove;1971: Simmons;1974).

Before a Markov Chain analysis can be used here several procedures must be followed to make the model operational. Probabilities must be specified for the movement between each pair of states in the system and the assumptions of Markovianness, order and stationarity tested. An important data problem here is the presence of zeros in the original origin - destination matrix If the transition probabilities are estimated by dividing every cell entry by the row total then these cells would have a zero probability in the transition matrix

which may threaten the regularity of the chain (Truelove, 1971). A transition matrix is regular only if some power of the matrix has only positive components (including no zeros) (Kemeny and Snell, 1959). Frequently, to ensure the regular nature of the chain very small probabilities or single linkages are entered into the transition matrix thus safeguarding the valuable properties of regular chains (Truelove, 1971; Simmons, 1974). This was not done here as initial testing showed that higher powers of the transition matrix did fit the definition of being regular by having no negative or zero entries in the cells. It was also felt that as many of the estates recorded only single linkages with others, to replace all zero links with one link would have substantially altered the system therefore no replacements were preferable.

Before applying the Markov chain, especially for predictive purposes, it is essential to test how well the data fit the assumptions. To test the order of the chain requires the ability to follow a set of sample households through the moving sequence more than once and this cannot be done here. Previous studies and general theory have however suggested that the first order model is the most appropriate for the study of residential mobility, with its high degree of spatial association and this will be assumed in the present study as in others (Simmons, 1974; Truelove, 1971). To test for stationarity a transition matrix for another

time period is required but as no predictive powers are claimed here this was not tested in the present study. The equilibrium (limiting) vector will indicate the implications of current patterns regardless of stationarity and this is sufficient for the present purpose.

The assumption of the Markov property can be tested by Anderson and Goodman's (1957) maximum likelihood criterion ratio. This sets up the null hypothesis, H_0, that the movement of people from one location to another is statistically independent with H_1 stating that the movement is <u>not</u> statistically independent i.e. Markovian. The test statistic used is $-2\ln\lambda$ which has an asymptotic χ^2 distribution with $(n-1)^2$ degrees of freedom, where

$$\chi^2 = -2\ln\lambda = -2 \sum_{i=1}^{n} \sum_{j=1}^{n} f_{ij} \ln (P_j/P_{ij})$$

$$\text{where } P_j = \sum_{i=1}^{n} f_{ij} \Big/ \sum_{i=1}^{n} \sum_{j=1}^{n} f_{ij}$$

$$\text{and } P_{ij} = f_{ij} \Big/ \sum_{j=1}^{n} f_{ij}$$

i.e. P_j is the proportion of migrants to destination state j and the P_{ij}'s are the transition probabilities.

On testing this for the present study <u>$\chi^2 = -2\ln\lambda = 1{,}738.32$</u> which is much greater than χ^2 with 841 degrees of freedom. The null hypothesis therefore can be rejected. Details of the test are given in Appendix 6.1.

Given this goodness of fit of the data to the Markov process the analysis of the 30 x 30 origin-destination matrix can proceed and the MFPTs and the equilibrium

vectors can be examined to facilitate in the description of the transfers.[15] By using the MFPTs as a measure of "distance" an assessment in relative terms only of the variation in "migrant distance" between estates can be made.[16] The full table of MFPTs is given in Appendix 6.2 and from an examination of this it is evident that those areas which were classed as popular in Chapter 5 have generally large MFPTs and that this is invariant whether transfers are from another popular area or an unpopular one. The MFPTs for moves into any area tend to be relatively constant and again do not vary greatly by source. However, there can be substantial differences between the MFPTs for two areas when movement in opposite directions is examined. For example, Wester Hailes to Craigmillar has a MFPT of 48.46 while that for moves from Craigmillar to Wester Hailes is 12.67. In the selected example, Table 6.12, a move from Niddrie to Prestonfield has a MFPT of 181.60 while a move from Prestonfield to Niddrie takes 49.94 time periods, thus emphasizing the large "migrant distance"

15. The Markov Chain computer program was supplied by Dr.L.Collins, Department of Geography, University of Edinburgh, being part of his Ph.D. thesis, "Markov Chains, Industrial Migration, Forecasting Aspects of Industrial Activity in Ontario" (Unpublished Ph.D. thesis, Uni of Toronto 1970). The program was adapted by the present user for use at the Edinburgh Regional Computing Centre.

16. The standard deviations of the first passage times must be examined for if they are of greater magnitude than the means, the means cannot be taken as typical values. The standard deviations here are of the same magnitude as the means and consequently they can be taken as fairly typical values.

Table 6.12 Mean First Passage Times To and From Niddrie to Other Popular and Unpopular Estates

Popular Estates	To Niddrie	From Niddrie
Prestonfield	49.94	181.60
St. Leonards	53.24	153.81
Central	51.31	137.38
Stenhouse	55.21	26.13
Leith	50.06	40.77
Newhaven	47.93	1567.85
Portobello	28.76	695.44
Northfield	40.23	103.99
West Mains	57.43	1949.35
Gorgie	51.35	88.76

Unpopular Estates	To Niddrie	From Niddrie
Craigmillar	33.40	35.99
West Pilton	53.00	41.60
Wester Hailes	54.23	12.72
Niddrie	25.77	25.77
Southhouse	49.78	118.11
Muirhouse	51.48	34.76
Sighthill	55.43	21.66
Gilmerton	49.74	28.33
Broomhouse	54.80	59.35
Gracemount	45.33	133.31

in terms of a move from an unpopular to a popular area. When moves between two similar areas are examined the "migrant distance" is less variable for example, the MFPT from Niddrie to Craigmillar is 35.99 while that from Craigmillar to Niddrie is 33.40. In cases where there are zeros in the original origin destination matrix there are exceptionally large MFPTs for example in the cases of Newhaven (1560.00), West Mains (1950.00) and Juniper Green (980.00) relecting the small probability of being transferred to any of these estates.

The MFPTs were used by Brown and Longbrake (1970) as a measure of functional distance between locations but as Simmons (1974) argues, the rows of the MFPT matrix are generally very similar in most empirical spatial systems and therefore the row elements are dependent largely on destination size. This would seem to be true here and the value of the MFPT matrix can only be in emphasising the inequalities existing within the transfer system and the differential demand for estates.

A more informative aspect of the analysis is the equilibrium distribution. Rogers views the equilibrium vector as a " ... kind of speedometer which describes the ultimate consequences of the current movement pattern if it remains unchanged" (Rogers, 1968; p. 92). The equilibrium vector illustrates how the population of the thirty council estates would be distributed if the movement process were to continue unchanged for thirty-two time

periods after which the equilibrium state is reached. This can usefully be compared with the actual distribution as it exists at present, to illustrate which estates would vary substantially either way from their present holdings. From the equilibrium vector (Table 6.13) it is evident that those estates which have received the greatest volume of in-movers in the period 1963-1973 are those which would have larger percentages of the total council population if the current movement pattern were to proceed unchanged for a very long time. Wester Hailes and Sighthill approximately double their present holdings while those smaller and more stables estates in the lower half of the table predominantly have decreased holdings.

If the ten popular and ten unpopular estates are again examined it is very interesting to find that if current movement patterns were to continue unchanged then the popular estates would have a decreased total of the distribution with the exception of Stenhouse which shows a slight increase (Table 6.14). The pattern for the unpopular estates is less clear with four remaining fairly constant, Wester Hailes, Sighthill and Gilmerton increasing their share and the rest showing a decrease in the percentage holdings. Obviously such a pattern would not occur in reality because of the workings of the allocation system, but this does indicate that if the percentage distribution is to remain stable (and this is necessary for full use of the potential housing stock), the pattern of transfers will have to alter from that found during the

Table 6.13 Actual Moves

Population Distribution between Estates

No.	Area	Values for Limiting Vector	Equilibrium Distribution %	Present Distribution %
1	Wester Hailes	0.17436	17.43	7.75
2	Sighthill	0.07893	7.89	3.95
3	St. Leonards	0.00745	0.75	1.45
4	Gilmerton	0.08158	8.16	7.65
5	Craigmillar	0.03409	3.41	3.33
6	Longstone	0.02271	2.27	1.47
7	Southhouse	0.01346	1.35	1.97
8	Muirhouse	0.05076	5.08	5.56
9	Leith	0.03459	3.46	4.13
10	Newhaven	0.00096	0.09	0.54
11	Niddrie	0.03880	3.89	5.76
12	West Pilton	0.03642	3.64	3.63
13	Northfield	0.04105	4.10	2.27
14	Southfield	0.02470	2.47	3.91
15	Granton	0.03544	3.54	6.59
16	Broomhouse	0.02021	2.02	2.07
17	Gracemount	0.01255	1.26	2.61
18	Oxgangs	0.04189	4.19	4.07
19	Stenhouse	0.08136	8.14	5.70
20	Prestonfield	0.00618	0.62	1.34
21	Portobello	0.00185	0.19	0.54
22	Lochend	0.05242	5.24	6.66
23	Clermiston	0.05119	5.12	5.42
24	Central Edinburgh	0.00787	0.79	1.67
25	Gorgie	0.01697	1.69	2.33
26	Drylaw	0.00967	0.97	2.41
27	The Inch	0.01679	1.68	3.45
28	Saughtonhall	0.00361	0.36	0.99
29	West Mains	0.00102	0.10	0.78
30	Juniper Green	0.00102	0.10	0.09

Table 6.14 Change in Distribution of Population in Popular and Unpopular Estates

	Equilibrium Distributions	
Popular Estates	Actual Moves Continue	Free Choice Applied
Prestonfield	decrease	increase
St. Leonards	decrease	decrease
Central	decrease	increase x 6
Stenhouse	slight increase	increase
Leith	decrease	increase x 2
Newhaven	decrease	increase x 3
Portobello	decrease	increase x 4
Northfield	increase	increase x 2
West Mains	decrease	increase x 6
Gorgie	decrease	increase
Unpopular Estates		
Craigmillar	no change	decrease x 2
West Pilton	no change	decrease x 4
Wester Hailes	increase x 2	decrease x 2
Niddrie	decrease	decrease x 3
Southhouse	slight decrease	slight decrease
Muirhouse	no change	decrease x 2
Sighthill	increase x 2	decrease
Gilmerton	increase	no change
Broomhouse	no change	decrease x 2
Gracemount	decrease	no change

study period. Areas with large amounts of new housing during the study period such as Sighthill and Wester Hailes had disproportionately large amounts of predicted growth but of course this would have been less over any other time period.

Actual Moves and Areas of Choice Compared

A comparison was made of the numbers actually moving into each area with the number of households who would have moved if they had accomplished the choice registered in their applications (Table 6.15). A chi-square test on the two sets of data showed the difference to be significant at beyond the 0.01 level. Seventeen estates were recorded as areas chosen more often than expected and twelve were chosen less often than expected. Broomhouse emerged as balanced with the same number choosing the area as actually moving into the estate. This, however, does not mean that individuals choosing this area would automatically achieve their choice for this analysis is based entirely on aggregate data. Of the estates which were chosen less often than expected nine were classed as unpopular in Chapter 5, one was popular, St. Leonards, and the rest were intermediate. There appeared to be a tendency for the larger estates to be chosen less often than expected but when size of estate was correlated with frequency chosen there was a moderately positive correlation ($r = +0.41$) which was significant at the 98% level. It may be however that frequency chosen correlates with size but that

Table 6.15 Actual Moves and Areas Chosen

Areas Chosen More Often than Expected		Areas Chosen Less Often than Expected	
	Longstone	U	Wester Hailes
P	Leith	U	Sighthill
P	Newhaven	P	St. Leonards
P	Northfield	U	Gilmerton
U	Gracemount	U	Craigmillar
P	Stenhouse	U	Southhouse
P	Prestonfield	U	Muirhouse
P	Portobello	U	Niddrie
	Lochend	U	West Pilton
	Clermiston		Southfield
P	Central Edinburgh		Granton
P	Gorgie		Oxgangs
	Drylaw		
	The Inch		
	Saughtonhall		
P	West Mains		
	Juniper Green		

	Balanced
U	Broomhouse

P - popular
U - unpopular (based on χ^2 test)

preference is not directly comparable with number of times chosen.

The areas which were chosen more frequently than the actual numbers of in-movers included nine of the ten popular estates, one unpopular one, Gracemount, and the remainder were intermediate. These areas tend to be the older, established areas of housing with positive images. Some of the areas which are over-subscribed to in terms of number of in-movers such as Wester Hailes, Sighthill and St. Leonards have large areas of new housing and while they have had (relatively) large numbers of vacancies, they have at the same time not had sufficient life spans to have obtained established images. Therefore people have been housed in these areas although they may not have considered them in their choice because of a lack of information about them.

A Markov Chain analysis was performed on the 'choice' data to attempt to judge how the distribution of population would vary, both in comparison with the present distribution among estates and with the distribution which was suggested by the limiting vector of the data on actual moves. Perhaps the two most important features of the change in distribution are those relating to Lochend and Central Edinburgh (Table 6.16). In Lochend the percentage holding of population would alter from 6.66% to 13.78% while in Central Edinburgh the holding would increase from 1.67% to 10.53%.

When this data is examined for the ten popular and

Table 6.16 Free Choice Data

Population Distribution between Estates

No.	Area	Values for Limiting Vector	Equilibrium Distribution %	Present Distribution %
1	Wester Hailes	0.02825	2.83	7.75
2	Sighthill	0.02675	2.68	3.95
3	St. Leonards	0.00683	0.68	1.47
4	Gilmerton	0.07760	7.76	7.65
5	Craigmillar	0.01476	1.48	3.33
6	Longstone	0.01432	1.43	1.47
7	Southhouse	0.01453	1.45	1.97
8	Muirhouse	0.02703	2.70	5.56
9	Leith	0.09044	9.04	4.13
10	Newhaven	0.01603	1.60	0.54
11	Niddrie	0.01672	1.67	5.76
12	West Pilton	0.00738	0.74	3.63
13	Northfield	0.04134	4.13	2.27
14	Southfield	0.04080	4.08	3.91
15	Granton	0.02996	2.99	6.59
16	Broomhouse	0.00704	0.70	2.07
17	Gracemount	0.02065	2.07	2.61
18	Oxgangs	0.02243	2.24	4.07
19	Stenhouse	0.06736	6.74	5.70
20	Prestonfield	0.01936	1.94	1.34
21	Portobello	0.02013	2.01	0.54
22	Lochend	0.13784	13.78	6.66
23	Clermiston	0.03138	3.14	5.42
24	Central Edinburgh	0.10534	10.53	1.67
25	Gorgie	0.03534	3.53	2.33
26	Drylaw	0.00839	0.84	2.41
27	The Inch	0.02992	2.99	3.45
28	Saughtonhall	0.00791	0.79	0.99
29	West Mains	0.02925	2.93	0.48
30	Juniper Green	0.00476	0.48	0.09

and unpopular areas the comparisons with the projections for actual movement are very striking (Table 6.14). The popular estates which were all predicted to have decreased holdings of the total population now all showed marked increases, in some cases up to six fold. Only one, St. Leonards, still registered a decreased holding. This can only further confirm the popularity of these areas. Conversely, the ten unpopular areas when free choice is considered all show a decrease or a stationary position, even Wester Hailes and Sighthill register a fall in their holdings.

This data on free choice then gives a very different picture from that which was reflected by present allocation patterns, again highlighting the differential demand for estates in the city.

Comparisons of the MFPTs for the 'choice' data and the actual moves also reveals some interesting differences. In general the MFPTs for all areas are much more uniform with none being extremely large. It is noticeable that some areas which in terms of actual moves were relatively close to others in terms of 'migrant distance' become more distinct if free choice were exercised. The MFPTs for Wester Hailes, West Pilton and Niddrie all increase. Others which had very large MFPTs with all other areas such as Newhaven and West Mains decreased by twelve and twenty-two times respectively.

Summary and Conclusions

The analysis carried out at the level of movement between estates has illustrated several interesting aspects of movement within the public housing sector. Using two different indices of mobility estates were ranked first by the proportion of in-movers and secondly by the proportion of out-movers. These two indices showed marked differences with the newer estates coming high on the list in the first case while those which were unpopular or had diminished local authority holdings due to clearance were highly ranked in the second instance. When gains and losses by transfers alone were examined, the unpopular estates were found generally to have deficits, while the more popular ones tended to gain, thus supporting the idea that transfer tenants were relatively privileged when compared with new tenants in terms of their allocation to more desirable areas.

From the initial examination of the pattern of moves it was evident that the estates seemed to interact in several sub-systems within the city. This was verified by carrying out a component analysis on the origin-destination matrix which illustrated the underlying patterns very clearly. This components analysis isolated ten important sub-systems in terms of their similarity of origins and destinations of the movers. The analysis also seemed to suggest that in some cases there was a type of hierarchy in existence, in that some estates while acting as receiving areas for certain others

sent their out-movers to another group of areas. A further feature of these sub-systems was found to be their high degree of internal interaction and their markedly close areal association. This was tested by looking at the interaction of estates in terms of the gravity model with estate size (population) and distance as the independent variables. Regression analysis here illustrated that distance was indeed an important factor in accounting for 40.8% of the variance in interaction.

An examination of the effect which these patterns of movement would have on the housing situation, if continued unaltered, was carried out by Markov Chain analysis. This suggested that if present trends were to continue the overall distribution of council tenants would change substantially. This also illustrated, from the matrix of MFPTs, the relative accessibility of the different estates to movers within the system.

A comparison was then made with the patterns and distributions which would occur if tenants who applied for transfers were able to exercise absolute freedom of choice. Here it was possible to illustrate those estates which would be more or less popular than would be expected from the actual pattern of moves. This was revealing in that it further illustrated that the newer and larger estates, in general, appeared to be less popular when compared with the older, established, smaller estates. A Markov Chain analysis of this data produced a very different pattern of potential population distribution from both the

actual distribution and that illustrated by the limiting vector of the Markov Chain on movement data. This latter analysis also proved to give very different accessibility levels between estates.

During this study of the pattern of moves between estates it was seen that the movement of tenants within estates accounted for a considerable proportion of all moves. The following chapter discusses these shorter distance moves and also draws some comparisons between the type of households transferring at the two levels and those new tenants who move into their first local authority tenancy but originate from shared accommodation within the estate.

CHAPTER 7

MOVEMENT WITHIN ESTATES

Introduction

One third (33.76%) of all the transfers and exchanges made within the Local Authority housing sector during the study period were moves which began and ended within the same estate. These moves were over very short distances, often ending within the same street or even block of houses. In this chapter the characteristics of these households and their housing situations will be examined to find the motivations behind these moves and the physical changes in the household's internal and external housing environments which resulted from them. It was felt that most moves were likely to have been made in a response to stress caused by changes in family structure which made dwellings unsuitable or a degree less suitable. Many of these short distance moves may also have been in a response to the need for a different form of housing due to changes in personal circumstances such as ill health. External environmental factors such a deterioration in the immediate neighbourhood due to vandalism and/or the encroachment of large areas of empty, boarded up houses may also have produced the necessary spur to movement as even by moving a short distance within an estate the external environment may be substantially altered.

The importance of short distance moves in intra-urban

mobility has been emphasized in many studies. Cullingworth (1968) noted that in Glasgow 42% of those moving within the Local Authority housing sector, moved only a distance normally covered on foot while Boyce in a study of Seattle found that 16% of all moves were under half a mile, despite the very different housing situation in the U.S.A.(Boyce, 1969). In another British study it was found that about half of the Local Authority tenants who wanted to move in London wished to move 2Km or less while in Newcastle some 50% wanted to move 1.5Km or less and 75% wanted to move distances of under 3Kms, (Bird, 1976).

The advantages of moving within an estate are several, for while a household can often greatly improve its housing and environmental quality, it can still retain contacts with friends, similar accessibility to facilities and stay within a familiar area. However, as all moves are subject to the constraints imposed by the Local Authority and the availability of suitable alternative accommodation, it is not merely a matter of the desire to move being automatically followed by a successful move. In Dundee for example, in 1973 under 1,600 moves were made by transfer while some 9,400 applications had been made (H.M.S.O., 1976). Thus it is those households who have had the greatest need to move or those who have been fortunate enough to arrange a mutual exchange who are examined here. It is not possible from the data available here to say what

proportion of Local Authority households are frustrated movers but for those moving within estates it is possible to gauge the degree of realisation of stated choices for relocation.

From this part of the study it is possible to assess whether these intra-estate moves are fulfilling the desires of those who move or whether a proportion of the population are trapped within an estate and only moving around within it in the real hope that they would have been able to have moved out. In Hull, Gray (1976) found that those classed as 'low status' tenants by the Housing Authority were generally unable to be mobile within the Local Authority sector unless they had an unquestionably good reason to move. No information was available here to allow direct comparisons but it has already been noted that those in the less popular estates are disadvantaged by the system of exchanges and it was also shown that the transfer system had built in inequalities due to the system of awarding points, (Chapter 5). In Dundee it was found that transfers were of limited use in enabling movement out of very unpopular areas for althoughthere were some 10,000 people in such estates only 250 moved to a better rated estate in 1973 (H.M.S.O., 1976). Taking all these findings into account, it was felt that it would be worthwhile to examine several estates in detail to assess the satisfaction achieved by these intra-estate moves.

Types of Intra-Estate Movers.

There are two types of households moving within the Local Authority estates in Edinburgh. Firstly, there are those who have held a Local Authority tenancy prior to the move and are either transferring or exchanging Local Authority houses and secondly, there are those households who move from a shared parental dwelling to their own Local Authority tenancy within the same estate. This latter group is comprised mostly of new households who have been sharing since marriage, but also includes modified households, such as one parent families after separation or divorce. Although these are almost entirely new tenants it was felt that it would be worthwhile to examine this group at least briefly in this context as such rehousing near parents is often characteristic of Local Authority estates and is even actively encouraged in some areas to aid in the stabilization of communities (English, 1976; SDD, 1974).

These moves from shared accommodation accounted for about a quarter of all the intra-estate moves recorded here (25.88%) but the numbers varied between estates. The proportion of new tenants from shared accommodation who took up tenancies within the same estate is shown in Table 7.1. Those estates which have the highest proportions are the less popular ones such as West Pilton, Niddrie, Southfield, Craigmillar and Muirhouse. This probably arises from the fact that, as these estates are less popular they have

Table 7.1. Proportion of New Tenants From Shared Accommodation who are Within-Estate Movers.

Estate	Total No. From Shared Accomm.	No. From Within Estate	% of Total
Wester Hailes	146	7	4.79
Sighthill	61	4	6.55
St. Leonards	8	1	12.50
Gilmerton	71	14	19.71
Craigmillar	41	9	21.95
Longstone	14	1	7.14
Southhouse	25	3	12.00
Muirhouse	87	18	20.68
Leith	18	1	5.55
Newhaven	3	0	-
Niddrie	93	33	35.48
West Pilton	45	17	37.78
Northfield	12	1	8.34
Southfield	33	9	27.27
Granton	62	9	14.52
Broomhouse	17	1	5.88
Gracemount	23	3	13.04
Oxgangs	31	3	9.67
Stenhouse	26	3	11.54
Prestonfield	6	0	-
Portobello	3	0	-
Lochend	33	6	18.18
Clermiston	51	2	3.92
Central	3	0	-
Gorgie	7	0	-
The Inch	29	1	3.45
Drylaw	19	0	-
Saughtonhall	3	1	33.34 *
West Mains	10	0	-
Juniper Green	1	0	-

* Figures unreliable due to small numbers involved.

shorter waiting lists and need fewer points to obtain entry than the more popular ones. While those couples who share with parents in the more popular estates have little chance of being allocated a first tenancy there, those who share in the less popular areas would probably be allocated such tenancies irrespective of origin. However, it may also suggest something about the social networks in these less popular estates in that so many new tenants wish to be rehoused there, near to their parental home. As will be seen in detail later, the realization of first and second choices for housing in these areas is remarkably high for new tenants and therefore it must be assumed that there is a realistic desire to remain in such areas.

When the proportion of transfers within estates is examined (Table 7.2), there are also some notable variations to be seen. Gilmerton had the highest proportion at 58% and is rather a special case, for during the study period there was a large programme of prefab redevelopment in the estate which resulted in large numbers of households being rehoused in phases as the programme proceeded. Craigmillar, Niddrie, Leith and Oxgangs also all lie in the upper quartile with high percentages of transfers having both their origin and destination within the estate. Generally, as might have been expected, the larger and more internally varied the estate in housing terms, the greater the proportion of intra-estate movement. The reasons for

Table 7.2. Proportion of Transfer Tenants by Estates who are Within Estate Movers.

Estate	Total No. of Transfer Tenants	No. of Within Estate Transfers	% of Total
Wester Hailes	64	8	12.50
Sighthill	49	12	24.48
St. Leonards	12	1	8.34
Gilmerton	146	85	58.22
Craigmillar	61	31	50.82
Longstone	25	8	32.00
Southhouse	30	10	33.34
Muirhouse	70	15	21.42
Leith	42	19	45.23
Newhaven	2	0	-
Niddrie	92	46	50.00
West Pilton	51	17	33.34
Northfield	43	10	23.25
Southfield	59	14	23.72
Granton	82	25	30.48
Broomhouse	30	4	13.34
Gracemount	26	9	34.61
Oxgangs	34	15	44.12
Stenhouse	90	27	30.00
Prestonfield	13	1	7.69
Portobello	8	2	25.00
Lochend	42	9	21.43
Clermiston	59	10	16.95
Central	20	5	25.00
Gorgie	26	7	26.92
Drylaw	26	5	19.23
The Inch	36	12	33.34
Saughtonhall	5	0	-
West Mains	3	1	33.34
Juniper Green	1	0	-

and results of these transfers will be examined in more detail for particular estates below.

Characteristics of Households Moving Within Estates.

Several characteristics of the movers were examined from the data available from the housing records. As stage in the life cycle and age of household-head are often stated as being the most important variables in determining mobility they were examined first. [17] All tests for significance were either Kolmogorov-Smirnov or chi-square, depending on the nature of the data and the significance level of $p = 0.01$ was taken for both. Details of all tests are given in Appendix 7.

Stage in the Life Cycle.[18]

Details of stage in the life cycle were not available for those moving within estates from shared accommodation. It was possible however, to compare those transfer tenants moving within estates and those moving between estates in terms of life cycle stage (Table 7.3). Those households who were moving within estates showed a tendency to be in the later stages of the life cycle with 61% of those moving within estates being in stage 5

[17] A full discussion of the determinants of mobility is given in Chapters 2 & 8.

[18] Stage in the Life Cycle uses the H.A.S.E. scheme described in McCarthy, 1976 and discussed fully in Chapter 8.

Table 7.3. Life Cycle Stage of Transfer Tenants Within and Between Estates.

Life Cycle Stage	Transfers Within		Transfers Between	
	No.	%	No.	%
1) Young single head, no children	0	0	5	0.71
2) Young couple, no children	5	1.27	12	1.71
3) Young couple, young children	87	22.08	191	27.17
4) Young couple, older children	61	15.48	110	15.65
5) Older couple, older children	68	17.26	57	8.11
6) Older couple, no children	86	21.83	140	19.91
7) Older single head, no children	66	16.75	135	19.20
8) Single head with children	18	4.57	53	7.54
9) All other	3	0.76	0	0

Source:

Life Cycle classification comes from The Housing Assistance Supply Experiment (HASE) in Brown County Wisconsin and was reported by McCarthy, K.F. 1976, in "The Household Life Cycle and Housing Choice", Papers of the Regional Science Association, Vol. 37, pp 55-80. Details here are taken from Table 1, p.58. This is fully discussed in Chapter 8.

(older household head with older children), or upwards while only 54% of those moving between estates were in this category. The single group most frequently involved in transfers, both within and between estates, was life cycle stage 3 (young household-head with young children). This group accounted for 22.08% of all within estate movers and 27.17% of all between estate movers. This was by far the largest group of between estate movers but accounted for only slightly more than life cycle stage 6 (older household head, no dependent children) for within estate transfers. The greatest difference between the two groups of transfer tenants came from life cycle stage 5 which accounted for some 17% of those moving within estates but only 8% of those moving between estates.

It was difficult to see why such a difference should occur in terms of the needs of this stage of the life cycle, but when the figures were examined by estates it was found that many of these households were involved in the prefab redevelopment scheme in Gilmerton. Given that those prefabs were first occupied in the late 1940's and early 1950's by young couples, then a move in the mid-1960's would, under a typical course of events, involve just this life cycle stage.

Age of Household Head

For age of household head, information was available for all groups involved. When all intra-estate movers

are taken together there is a fairly even distribution of movers in all age groups from 20 to 50 years and many fewer at younger and older ages, (Table 7.4). However, when those movers who are new Local Authority tenants are examined alone it is evident that they portray a pattern similar to all new tenants from shared accommodation (Chapter 4) with their household heads in the 20 to 30 year age groups. The difference in age between this group and those established Local Authority tenants who are transferring between dwellings is quite marked. Only 6.64% of transfer household heads are aged below 30 compared with 67.34% of those from shared accommodation.

Perhaps a more interesting aspect was that a significant difference was found when the age of household-heads was compared for those transferring within an estate and those moving between estates. Of those moving between estates by transfer 15.75% were aged under 30 years while 72.12% were aged between 30 and 65 years and only 12.11% were over 65 years. This compares with 6.64% below 30 years of age, 78.72% between 30 and 65 years and 14.48% over 65 years for those moving within estates. Thus those moving between estates have generally younger household heads than those moving within estates, (Table 7.5).

It is difficult to say why such a difference should occur but perhaps it may be that the older household heads who may have lived in an estate for a long time

Table 7.4. Age of Household Head for Intra-Estate Movers

Age	15-19.9	20-24.9	25-29.9	30-34.9	35-39.9	40-44.9
% All	1.58	10.03	10.07	10.56	9.68	10.38
Shared	5.44	34.69	27.21	12.24	5.44	3.40
Transfer	0.24	1.42	4.98	9.87	11.16	12.82

Age	45-49.9	50-54.9	55-59.9	60-64.9	65-69.9	70 +
% All	11.44	8.45	8.27	7.57	6.69	4.57
Shared	4.08	2.04	1.36	2.04	0.68	1.36
Transfer	14.01	10.68	10.68	9.50	8.78	5.70

Table 7.5. Age of Household Head for Transfers Within and Between Estates.

Age	15-19.9	20-24.9	25-29.9	30-34.9	35-39.9	40-44.9
% Within	0.24	1.42	4.98	9.87	11.16	12.82
% Between	0.12	3.88	11.75	11.15	14.06	13.09

Age	45-49.9	50-54.9	55-59.9	60-64.9	65-69.9	70 +
% Within	14.01	10.68	10.68	9.50	8.78	5.70
% Between	8.24	9.34	9.82	6.42	6.42	5.69

but need to move still wish to retain their home in an area where they have an identity and friends. Even in the younger age groups from 40 years upwards it is likely that households have established roots in an area and are less likely to wish to sever them by moving a long distance to another estate. This has been also noted elsewhere for example, (Murie, 1974). However, with the lack of individual personal details this can only be speculated here. When the duration of residence of the two groups of transfer tenants was examined, such ideas would seem to be supported.

Another likely influence of which there is definite evidence here, is the fact that many of the intra-estate movers were coming from internal redevelopment of rehabilitation programmes in such estates as Gilmerton, Longstone, West Pilton, Craigmillar and Sighthill and as these programmes frequently involved the original tenants of dwellings it was to be expected that they would be older than transfer tenants in general.

This examination of age of household head has further substantiated the findings of the investigation of stage in the life cycle. It would appear from both these examinations that those who transfer within estates are generally older than transfer tenants on the whole.

Duration of Residence.

Duration of residence in the previous dwelling was

measured. As expected those who moved from shared accommodation within an estate had remained only a short time in their previous home, (Table 7.6). Almost 70% of these movers had stayed only one year or less in their shared accommodation and none had stayed longer than seven years. This is in comparison with only 6.4% of within estate movers and 10.4% of between estate movers who moved house before one year of residence had elapsed.

Over half (50.55%) of those moving within an estate had moved within ten years of entering their last house while almost 65% of those moving between estates had done so in this time period. In both groups around 13% had lived in their last house for twenty years or more before moving. In West Yorkshire, Murie found that 64% of continuing Local Authority tenants had lived in their previous house for ten years or less and 36% had lived there for over ten years, (Murie, 1974). Watson in his study of West Central Scotland found that 41% had lived in their home for over ten years and 19% had not moved for more than twenty years, (Watson, 1973). Therefore the present figures do not seem to be atypical for lengths of stay.

When the figures were tested all differences were found to be significant and thus it can be definitely stated that those tenants who are transferring within estates had a longer duration of residence in their previous home than those moving between estates. This may be partly accounted for by the differences in age

Table 7.6. Duration of Residence in Previous Home in Number of Years.

Length of Stay (yrs)	Under 1	1	2	3	4	5	6
From shared %	30.61	38.77	15.64	7.48	3.40	2.04	1.36
Transfer within %	1.18	5.22	6.65	4.51	4.03	5.70	4.75
Transfer between %	3.26	7.14	8.47	8.35	8.23	7.14	5.69

Length of Stay (yrs)	7	8	9	10	11	12	13
From shared %	0.68	-	-	-	-	-	-
Transfer within %	4.27	4.27	5.70	4.27	4.51	7.13	3.32
Transfer between %	5.56	3.63	3.99	3.39	3.75	2.18	2.78

Length of Stay (yrs)	14	15	16	17	18	19	20+
From shared %	-	-	-	-	-	-	-
Transfer within %	3.08	2.61	2.85	5.70	4.03	3.32	12.82
Transfer between %	2.42	1.93	2.18	1.57	3.26	1.81	13.19

structure between the two groups in that the older household heads who tend to be within estate movers, are on the whole less likely to be inclined to move at all, (Chapter 9). Also the fact that those who move within estates give more Involuntary reasons for moving may suggest that many households would have been relatively satisfied with their previous dwelling and therefore more likely to have remained in it for a longer period of time. However, it may have been that the apparent satisfaction and the lack of the desire to move of their own volition was promoted by the knowledge of forthcoming Local Authority plans for rehousing due to redevelopment as 82% of involuntary moves made by transfer tenants within estates were for redevelopment or rehabilitation programmes.

Reasons for Moving Within Estates.

This is dealt with fully in Chapter 8 but a brief examination of the broad types of reasons given for movement is in order here. When the reasons given for moving are compared for those moving within estates from shared accommodation and those transferring within and between estates there are some marked differences to be seen, (Table 7.7). In all cases moves for Family Life Cycle reasons are the most important but they are only slightly more important than moves for Social/Environmental reasons for those from shared accommodation and minimally more important than Involuntary reasons for those

Table 7.7. Reasons for Moving Within Estates.

Type of Reason	% All Within	% Shared Accomm.	% Transfers Within	% Transfers Between
Family Life Cycle	38.07	46.85	34.45	39.48
Personal/Health	13.45	2.85	17.32	21.04
Social/environmental	19.87	41.71	12.32	9.87
Access	1.37	1.14	1.46	12.25
Involuntary	27.21	7.42	34.45	17.35

Full details of the make up of these categories of reasons are given in Chapter 8.

transferring within estates. The importance of Family Life Cycle reasons in all cases comes from the expressed desire for a house of a different size by a high proportion of movers. In all three groups around 30% of the total reasons given are specifically for a change in house size. For those moving from shared accommodation the desire is totally for a larger dwelling whereas in both transfer situations over 10% were requesting a smaller dwelling.

Apart from the similarity in the numbers of Family Life Cycle reasons given by the different groups there are some important differences. Those moving from shared accommodation gave a very high number of Social/Environmental reasons reflecting the strong desire for a home of their own and the unsuitability of their shared tenures. The small proportion of those moving for health reasons was to be expected in this younger age group and such reasons were much more important for transfer tenants, particularly those moving between estates. The difference between the two transfer groups with regard to this type of reason arose from the movement to be near relatives or friends because of ill health. This accounted for 1.04% of all reasons given by those moving within estates but 5.31% for those moving between estates.

A similar difference, but even more pronounced, was seen for those moving for Access reasons. This type of reason accounted for only around 1% of all

reasons given by within estate movers but 12% of the reasons given by those moving between estates. Considering the relatively small size of most of the Local Authority estates, access particularly to work-place, was unlikely to be significantly improved by a move within an estate. However, for someone perhaps living in Lochend and working in the Sighthill Industrial Estate a move to Sighthill or Wester Hailes could substantially reduce the time and cost of travel to work.

Involuntary reasons are of very different importance to the three groups. Those moving from shared accommodation were much less likely to have moved for any of the Involuntary reasons, apart from homelessness, than those who transferred within estates. This latter group gave over 30% of all their reasons for moving in the Involuntary category and these were mainly due to prefab redevelopment and rehabilitation of older property. These two reasons accounted for 28.18% of all reasons given by transfer tenants moving within estates but only 11.60% for those moving between estates. These Local Authority improvement programmes were therefore of outstanding importance in stiumulating within estate mobility in the time period studied.

Other Characteristics.

Several other characteristics of those moving

within estates were examined but none of these gave statistically significant differences between the two groups of transfer tenants, therefore the following discussion is mainly confined to those moving within estates except where particularly interesting patterns occur.

Number of Persons in the Household.

When the two groups of within estate movers were taken together, households of two and three persons appeared to be the most numerous but when separated there were differences worth noting, (Table 7.8). Those households from shared accommodation were predominantly two and three person households, (65.30%) comprised of young couples with none or only one of a family. The transfer tenants had almost three times as many one person households which probably was a reflection of the different age structures of the two groups and the higher proportion of O.A.P.s and widows in the transfer group. There were also three times as many households of six or more persons in the transfer group and this was also probably related to the differences in age structure.

Age of Dependents.

The differences here were as would be expected, with those from shared accommodation having a much higher proportion of young dependents, (Table 7.9). Over half the dependents in the households from

Table 7.8. Number of Persons in the Households who are Moving Within Estates

Number of Persons	1	2	3	4	5	6+
% of All Households	8.09	23.06	22.18	18.83	14.78	13.02
% From Shared Accomm.	3.40	28.57	36.73	13.60	12.92	4.76
% Transfer Households	9.73	21.14	17.10	20.66	15.44	15.91

Table 7.9. Age of Dependents in Households Moving Within Estates.

Ages	0-4.99	5-9.99	10-14.99	15-19.99	20-24.99	25-29.99
% Shared	50.84	30.50	10.73	6.77	0	0.56
% Transfer	17.79	25.13	22.82	18.75	7.88	1.90

Ages	30-34.99	35-39.99	40-44.99	45-49.99	50-54.99	55-59.99
% Shared	0.56					
% Transfer	1.49	0.54	0.67	0.27	0.40	0.27

Ages	60-64.99	65-69.99	70+
% Shared			
% Transfer	0.54	0.54	0.95

shared accommodation were under five years old and 92% were under fifteen years of age compared with only 65% of the dependents of transfer tenants.

Although no significant difference was found between the two groups of transfer tenants it is interesting to note that although those household heads who were moving between estates were generally younger they had a similar proportion of dependents below ten years of age but a higher proportion between ten and fifteen years. It has been suggested elsewhere that school age children represent a tie to a particular community and consequently that families with children of this age tend to be less residentially mobile than others, (Long, 1972). From the limited evidence here it seems that those families with children of school age are just as likely to move between estates as within them. Indeed if anything they are slightly more likely to move between areas. For households moving between estates 52.46% of dependent children are aged between five and fifteen years while only 47.95% are in this age group for households moving within estates. It is unlikely however, that this in any way reflects an attempt to move to achieve a change of school as this is seldom mentioned in any of the housing records. This finding may suggest that such ties are of relatively less importance for Local Authority households than for owner occupiers where it is a

well recognised influence on house purchase. In both Edinburgh and Glasgow, and probably in most cities in the country, the pressures on housing in desirable school catchment areas have increased in recent years, particularly since the introduction of the comprehensive education system. Unfortunately, the information details here will not support any firm conclusions about this matter because of the lack of detailed individual information and any statistically significant result.

Civil Status of Household Heads.

The main difference here was the much higher percentage of new tenants who were divorced. This group comprises 21.76% of those moving from shared accommodation but only 4.27% of those moving within estates by transfer, (Table 7.10). This large variation can be explained by the fact that frequently prior to divorce, the wife and children move out of the marital home and go to live with the wife's parents. When subsequently applying for a new home of her own she will often prefer to remain within a short distance of her parental home from which she will continue to receive help and support.

The other major difference was in the higher proportion of widowed household heads who move by transfer. This accords with the differences found in both age structure and number of persons in the household which were discussed above. The difference in

Table 7.10. Civil Status of Household Heads Moving Within Estates.

	Married	Single	Widowed	Divorced
% All Households	76.05	3.31	11.79	8.80
% From Shared	71.43	4.08	2.72	21.76
% Transfers	77.67	3.08	14.96	4.27

Table 7.11. Sex of Householder

Householder	Male	Female
% From Shared	70.75	29.25
% Transfers	80.99	19.01

numbers of divorced household heads in particular, was reflected in the higher proportions of female household heads from shared accommodation, (Table 7.11). Long (1972) found that female household heads were likely to be more mobile locally than husband and wife families but in the present study there was no significant difference between the number of female household heads who were moving within and between estates by transfer. In both cases the proportion of mobile female householders was around 19%.

Socio-Economic Status of Within Estate Movers.

Socio-economic status has been found to be so relatively uniform within the Local Authority housing sector, that it has not usually been a statistically significant indicator of differences between different groups of tenants. Here is no exception. Neither those moving from shared accommodation nor those moving between estates showed any significant difference from those moving within estates in terms of socio-economic status. Only when the three non-economically active groups were examined was any significant difference found. Transfer tenants within estates had a higher proportion of retired household heads while those from shared accommodation had a higher number of housewives, (Table 7.12). Such differences were to be expected in the light of the characteristics discussed above. It is interesting to note the higher

Table 7.12. Non-Economically Active Household Heads Moving Within Estates.

	Unemployed	Retired	Housewives
% From Shared	43.24	13.52	43.24
% Transfers	26.05	46.87	27.08

Table 7.13. Distribution of Transfer Tenants by Number of Apartments Before and After Moving (Within and Between Estates).

Within Estate Transfers

No. of Apartments		1	2	3	4	5	6
Before Moving	%	1.66	9.26	62.94	23.99	1.90	0.23
After Moving	%	0.71	16.15	45.13	32.06	5.94	-

Between Estate Transfers

No. of Apartments		1	2	3	4	5	6
Before Moving	%	4.47	11.25	57.99	23.36	2.90	-
After Moving	%	0.84	16.34	45.39	30.99	6.41	-

proportion of those who were unemployed at the time of the move from shared accommodation. Perhaps the fact that such household heads did not have the upkeep of a home to worry them may have acted as a sort of negative influence in the search for employment but no doubt more serious factors were the real cause of the relatively high levels of unemployment in this group.

Size of House (Number of Apartments) Before and After the Move.

Those from shared accommodation were predominantly in one apartment before moving (95.91%) meaning that they had a bedroom of their own and shared the facilities of the rest of the house. After moving some 70% were in three apartment homes while 22% were in larger accommodation and the remainder in dwellings of less than three apartments. From this it is obvious that those new tenants were in very different circumstances from the transfer tenants before moving and that the move to their own home made a substantial improvement in their space standards. However, the new tenants who moved within an estate also had different space standards from the transfer tenants even after the move. The majority of new tenants went to three apartment homes but transfer tenants, although still concentrated in three apartment homes (45.13% after moving) tended to move out of these dwellings to both larger and smaller homes, (Table 7.13).

For transfer tenants then, while there was an increase of 6.89% in the numbers housed in two apartment dwellings and also 11.88% more in homes of four apartments or more there was a corresponding decrease of 17.81% in the numbers in three apartment dwellings. When the house sizes of those transferring within and between estates were compared no statistically significant differences were found either before or after the move. However, those transferring between estates did experience a similar pattern of moving out of three apartment dwellings into both larger and smaller ones. Whereas the difference in house size pre-move and post-move was not significant for movers within estates, due to this two way flow to larger and smaller dwellings, the difference was significant for those moving between estates. The flow to larger homes although no greater than that in intra-estate movement was not offset to the same extent by moves to two apartment dwellings. Those moving between estates already had a higher proportion in two apartment dwellings before the move. These moves to smaller dwellings were mainly O.A.P.s and older households who were moving to more easily managed smaller units and in some cases to purpose built sheltered accommodation.

Areal Patterns of Within-Estate Movers.

Having examined the types of families that were

moving within estates and why they moved it was felt to be important to look at the areal patterns of these moves to establish whether there were areas in estates which were losing or gaining by this internal movement or whether there was no variation throughout the areas. It was felt likely in the light of results in Chapter 5 that those estates with high levels of internal variation in terms of the points required for entry would display differences in areas of inflow and outflow.

Ten estates were distinguished with two or more areas within them, which could be allocated an average number of points required for entry from the Housing Department's points table (Chapter 5, Table 5.5). These estates are given in Table 7.14. For each area the moves into, from and the balance was calculated. In six out of the ten estates, those areas which gained from intra-estate movement had higher points required for entry than those losing by this movement. One had a similar points level and three of those areas which were losing had higher points levels than those gaining.

For those areas of estates which were gaining from intra-estate moves the average number of points required for entry was 198 whereas the average number of points required for entry to those areas which were losing by intra-estate movement was 157. This suggested a gravitation towards the more popular parts of the estates but on taking the numbers to and from areas by points levels the differences in flows between areas was not statistically

Table 7.14 Estates Internally Differentiated by Points Levels

Estate	Areas	Average Points Levels
Leith	Warriston	300
	Redbraes	300
	Central Leith	191
	Pirniefield	300
Niddrie	Niddrie Mains	58
	Niddrie Marischal	72
	Niddrie Mill	79
Northfield	Northfield	300
	Meadowfield	245
Southfield	Coillesdene	300
	Milton Road	189
	Bingham	63
Granton	Granton	67
	West Granton	74
	Boswall	229
Stenhouse	Stenhouse	300
	Saughton Mains	201
	Westfield	300
Lochend	Lochend	193
	Restalrig	215
	Craigentinny	227
	Piershill	151
Gorgie	Chesser	325
	Hutchison	281
Craigmillar	Craigmillar Castle	66
	Greendykes	65
Gilmerton	Hyvots	78
	Moredun	77

significant (Appendix 7.3).

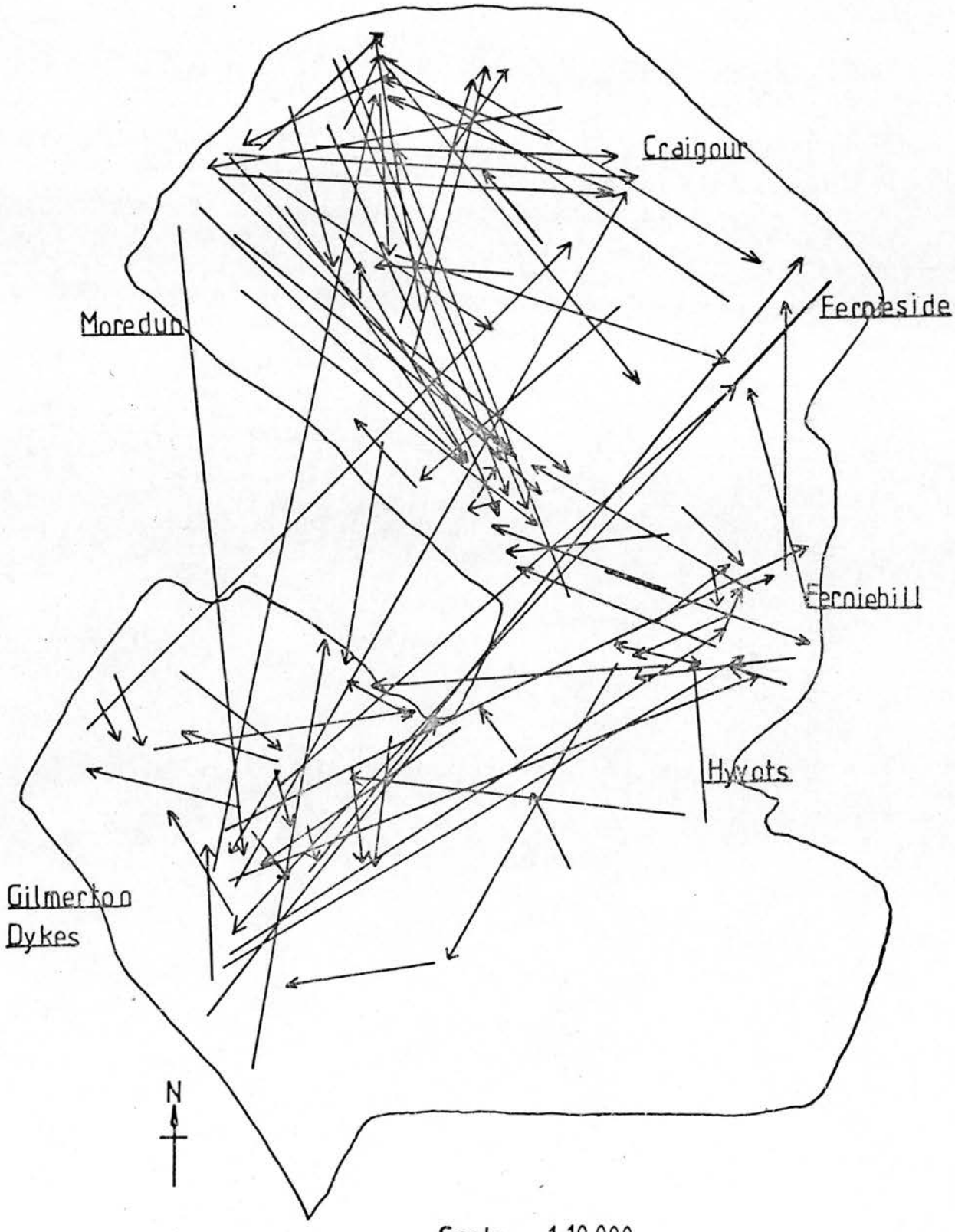
These flows are only gross flows and it is not clear from these whether there were large flows in both directions i.e. from better to poorer areas and the reverse or whether most flows were contained within one 'type' of area with only a few crossing the boundaries. In an attempt to add more detail to this, the four estates with the greatest intra-estate movement were examined more closely. These estates were Gilmerton, Niddrie, Craigmillar and Granton.

Gilmerton

Intra-estate moves in Gilmerton are shown in Figure 7.1. From this it is evident that several distinct areas of interaction were in existence. The majority of the movement occurred in Moredun which was the destination for 40% of all the moves in the estate. Ferniehill with 17% and Gilmerton Dykes with 15% were the next most popular districts for destinations. Moredun was the area of the greatest amount of prefab redevelopment and 28% of all the intra-estate moves had both their origin and destination there.

When the six areas of the estate were looked at separately it was found that 56.56% of all moves began and ended within the same area and only 43.43% moved between areas. Therefore not only were these moves local in terms of being within one estate but they were parochial within the estate. Of these within area moves 50% were within Moredun and around 20% each in Ferniehill and Gilmerton Dykes (Table 7.15).

Figure 7.1 Intra-Estate Movement in Gilmerton



Scale 1:10,000

Table 7.15 Intra-Estate Movement in Gilmerton

Area of Estate	No. Origins	No. Destinations	Balance
Moredun	39	40	+1
Ferniehill	20	17	-3
Craigour	7	9	+2
Fernieside	4	5	+1
Hyvots	6	13	+7
Gilmerton Dykes	23	15	-8

Approx. Date Built	Area	Moves Within		Moves Between			
				To		From	
		No.	%	No.	%	No.	%
1966-67	Moredun	28	50.00	12	27.91	11	25.58
1968-71	Ferniehill	11	19.64	6	13.95	9	20.93
1949-50	Craigour	1	1.78	8	18.60	6	13.95
1950-53	Fernieside	0	-	5	11.63	4	9.30
1962	Hyvots	5	8.93	8	18.60	1	2.32
1950-53	Gilmerton Dykes	11	19.64	4	9.30	12	27.91
			100.00		100.00		100.00

When the moves between areas were looked at it was seen that Moredun, Fernieside, Craigour and Hyvots all gained but Ferniehill and Gilmerton Dykes both lost. Gilmerton Dykes in particular appeared to do badly from this internal movement and this may be related to the fact that it is one of the older parts of the estate, although Fernieside and Craigour which are of similar age and construction did not fare so badly.

As 85.5% of all the moves within Gilmerton are transfers and only 14.14% are from shared accommodation it is mainly the pattern of transfers which have been discussed here. Any assessment of the way in which points levels affected the movement between areas is impossible here as the Housing Department subdivide the estate into two parts only, namely, Moredun and Hyvots. Moredun also includes Craigour, Fernieside and Ferniehill while Hyvots incorporates Gilmerton Dykes. For these two broad areas the points levels for entry were 77 and 78 respectively, therefore with such a minimal difference there would be little influence on the relative eligibility of households for different parts of the estate.

It seems more likely that the age of housing and its form have an important influence on the internal movement patterns, with post 1960s housing gaining and the earlier stock losing. (Ferniehill which is mainly very recent housing loses on balance because of the inclusion of the Drum area which is old housing stock). Although no quantitative evidence is available here on why the newer areas

Figure 7.2

7.2a. Moredun Park View

7.2b. Moredun Dykes Road

7.2c. Ferniehill Place

7.2d. Fernieside Crescent

7.2e. Hyvots Gardens

7.2f. Gilmerton Dykes

are preferred in general in Gilmerton, a brief look at the accompanying photographs would seem to suggest that if part of environmental quality is the visual appeal of buildings then the newer areas provide a more pleasant housing aspect, apart from their more modern amenities (Figure 7.2).

Niddrie

Niddrie can be subdivided into three parts, Niddrie Mains, Niddrie Marischal and Niddrie Mill and these are shown with the movement between them in Figure 7.3. There was a very large amount of movement out of Niddrie Mains and a corresponding inflow into Niddrie Marischal (Table 7.16). Almost 47% of all movers remained within the same parts of the estate while 53.16% moved between areas, which is higher than the between area movement in Gilmerton. When those from shared accommodation and those who transferred within Niddrie are examined separately then it can be seen that 57.57% of those from shared accommodation remained within the same area but only 39.13% of those transferring did so. The same proportion of shared and transfer tenants moved from Niddrie Mains to Niddrie Marischal but a higher proportion of transfer tenants moved in the opposite direction (Table 7.17). This is surprising as Niddrie Mains is generally a very unpopular area as indicated by its low level of points required for entry (58). However, perhaps this can be explained to some extent by the accompanying photographs which plainly illustrate that not

Table 7.16 Intra-Estate Movement in Niddrie

Area of Estate	No. Origins	No. Destinations	Balance
Niddrie Mains	58	35	-23
Niddrie Marischal	19	42	+23
Niddrie Mill	2	2	-

Table 7.17 Details of Intra-Estate Movement in Niddrie

Approx. Date Built	Area	Moves Within		Moves Between			
				To		From	
		No.	%	No.	%	No.	%
1935	Niddrie Mains	27	72.97	8	19.05	31	73.81
1952/66/71	Niddrie Marischal	10	27.03	32	76.19	9	21.43
1959/66	Niddrie Mill	0	-	2	4.76	2	4.76

Flows

	From Shared Accomm.		Transfers		Total	
	No.	%	No.	%	No.	%
Mains-Marischal	10	71.43	20	71.43	30	71.43
Mains-Mill	0	-	1	3.57	1	2.38
Marischal-Mains	2	14.28	6	21.43	8	19.05
Marischal-Mill	0	-	1	3.57	1	2.38
Mill-Marischal	2	14.28	0	-	2	4.76

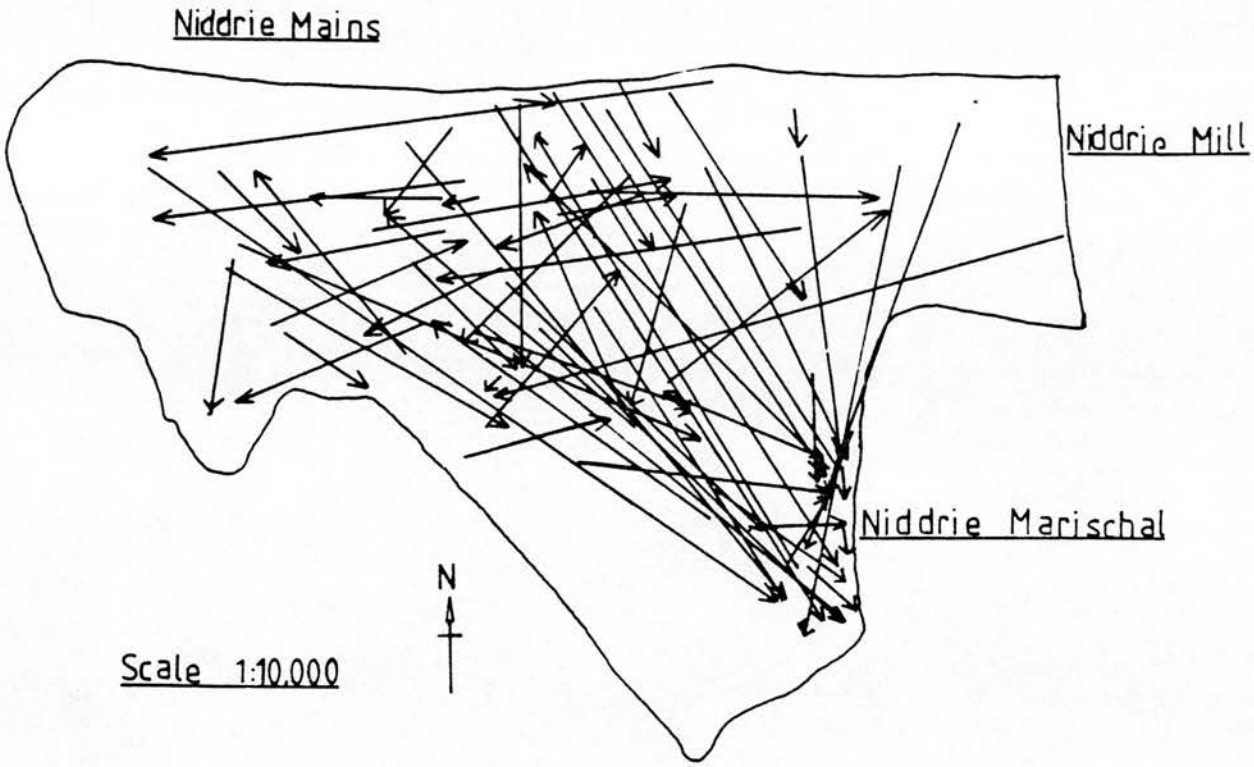
Table 7.18 Intra-Estate Movement in Craigmillar

Approx. Date Built	Area of Estate	No. Origins	No. Destinations	Balance
1938-39	Craigmillar Castle	30	26	-4
1962	Greendykes	10	14	+4

all parts of Niddrie Mains are of a similar environmental quality (Figure 7.4).

Niddrie Mains was discussed elsewhere (Chapter 5) as being one of the prime examples in Edinburgh of a deteriorating Local Authority housing area. Built under the 1930s slum clearance Housing Acts it has never been able to overcome the stigma which it soon obtained of being an area of great concentration of low social status, low income residents. It is important, however, to realize that the major deterioration in Niddrie and the other estates in a similar position such as Craigmillar and West Pilton, has only occurred in relatively recent years. In a Scottish Development Department study of such an area it was suggested that the increased provision of houses in the late 1950s and early 1960s, together with a typically static population, produced a 'loosening' of the housing market which led to a movement out of these areas (SDD, 1974). In Niddrie, as in Craigmillar which is discussed below, there was a substantial increase in the number of new houses available at this time at Niddrie Marischal and in Craigmillar at Greendykes. Also it is worth noting that not only was Edinburgh's population static at this time but it decreased between 1961 and 1971. Thus it is likely that there was a loosening of the housing supply within these areas which would encourage a movement out to the newer parts. Further, a concentration of problem tenants in these older areas, whether as a result of deliberate Housing Department policy or not, has only succeeded in hastening the outflow to

Figure 7.3 Intra-Estate Movement in Niddrie



other parts of the estate.

Whether these were the mechanisms at work in Niddrie or not, the fact is that the Niddrie Mains part of the estate in particular has deteriorated in recent years and the result of this environmental and social decay is seen in the high amount of movement out of the area. In the Scottish Development Department study it was found that with the increase in internal movement within the estate the pattern which developed was one of movement nearer to close relatives and/or movement to the more desirable areas of the scheme. Although no evidence of the first objective in moving can be investigated here due to lack of data, the movement definitely reflected a wish to move home to the more desirable parts. This has produced a pattern of movement away from the centre of the scheme towards the outside and in particular is reflected in a movement away from Niddrie Mains Terrace where 76% of all the vacant houses in the scheme were found at the time of study and now is almost entirely boarded up awaiting rehabilitation. The level of vacant houses is very useful as an indicator of the environmental quality differences which exist between the three parts of the estate. In a study in 1974 it was found that 14% of all houses in Niddrie Mains were lying vacant compared with 2.1% in Niddrie Marischal and 1.1% in Niddrie Mill (Clarke et al., 1974). However it is also worth noting that in a small study by the Niddrie Mains Rehabilitation Planning Group over 75% of the residents interviewed stated that they liked living in Niddrie and

Figure 7.4

7.4a. Niddrie Mains Terrace

7.4b. Niddrie Mains Terrace

7.4c. Niddrie Mains Terrace

7.4d. Niddrie House Square - Niddrie Marischal

7.4e. Niddrie Marischal Crescent

7.4f. Niddrie Mill Grove

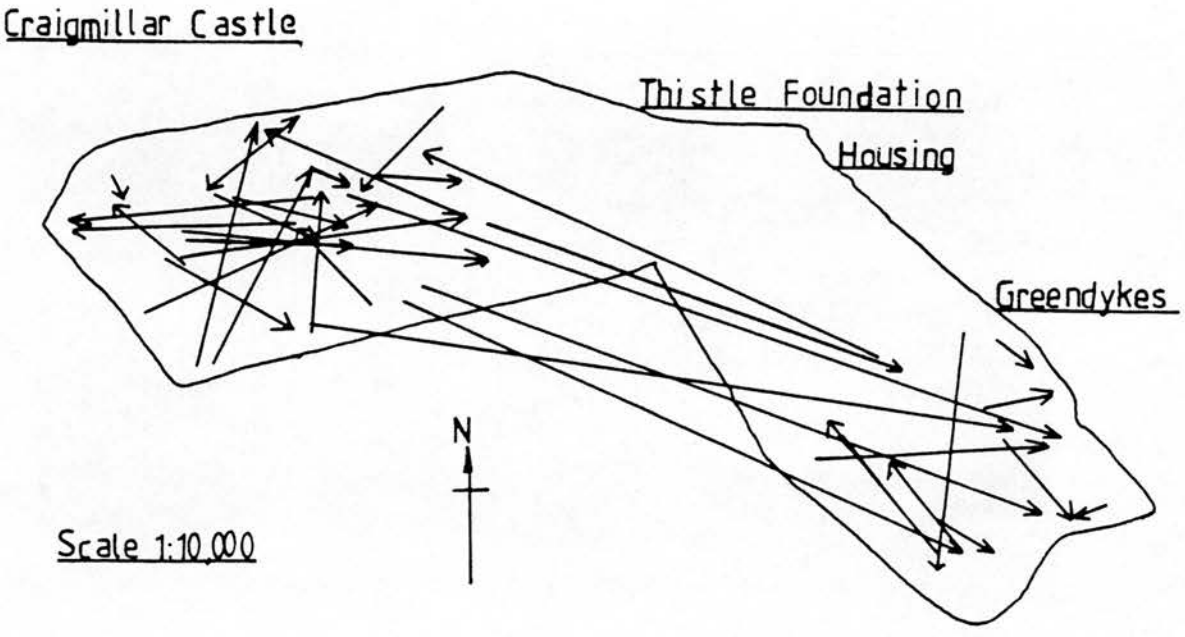
that 83% said that they would like to remain in the area if improvements were carried out (Edinburgh Evening News, 7.10.75). The diversity of environmental quality in Niddrie can also be assessed from the accompanying photographs (Figure 7.4).

Looking at the moves in Niddrie according to levels of points required for different parts of the estate it was found that 46.84% moved within areas requiring similar points levels while 40.50% moved to parts with a higher points level and only 12.66% moved to areas requiring fewer points.

Craigmillar

Craigmillar is very similar to Niddrie with much of the movement out of the 1930s built Craigmillar Castle part of the estate (Figure 7.5, Table 7.18). However, much more of the movement in Craigmillar is within the one area than in the other estates. A total of 85% of all moves start and end within the same area and 62.5% of these are within Craigmillar Castle. The smaller flows between areas may be a result of the physical separation of the two parts of the estate by the Thistle Foundation housing in Queen's Walk. However, of those moves which did go between areas, 83.34% began in Craigmillar Castle and ended in Greendykes, therefore here, as in Niddrie, there is a positive flow towards the newer housing on the estate. The pattern for those who moved from shared accommodation was very similar to that for those transferring. In both cases over 60%

Figure 7.5 Intra-Estate Movement in Craigmillar



remained within the same part of the estate but while all shared moves between areas ended in Greendykes only two-thirds of transfers flowed this way.

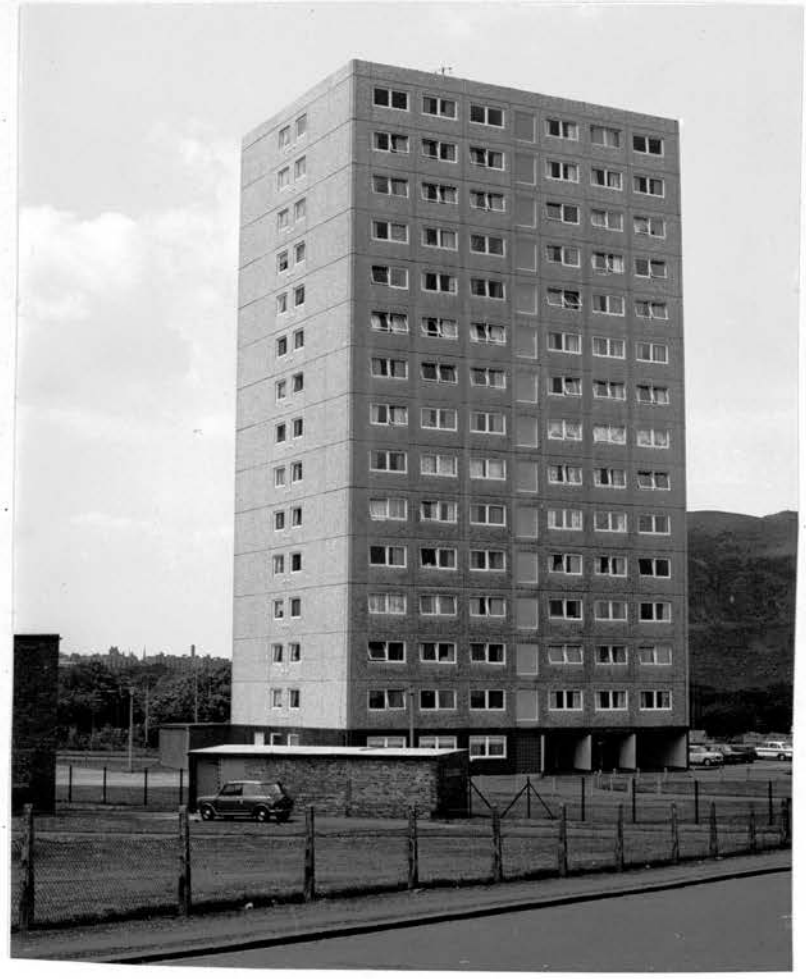
Again it is possible to use the level of empty houses in the two areas to illustrate the difference in environmental quality between them. In 1974 the level of vacant homes in the Craigmillar Castle part of the estate was 16.9% of all houses, compared with 2.1% in Greendykes (Clarke et al., 1974). This together with the accompanying photographs of the two parts of the estate gives some indication of the improvement in external physical environment which could be obtained by moving from parts of Craigmillar Castle to Greendykes (Figure 7.6).

The very high proportion of internal movement in the Craigmillar Castle part of the estate may have been due to families wishing to move nearer to relations or the desire to move away from the centre of the estate, in particular Craigmillar Castle Terrace, but a substantial amount was because of the Local Authority rehabilitation programme. Transfers under this programme were often short term, two way affairs with the household moving out to temporary accommodation nearby while their home was being renovated and then returning. Some 43% of those transfer households who moved in Craigmillar gave such reasons for their move.

As in Gilmerton the degree of similarity in the points required for entry to both parts of the estate meant that there was little effect on eligibility of movers to either area in official terms at least.

Figure 7.6

7.6a. Craigmillar Castle Terrace



7.6b. Craigmillar multi-storey

7.6c. Greendykes Road

7.6d. Greendykes Road

Granton

In Granton there is rather more internal differentiation in terms of the number of points required for entry to different parts of the estate (Table 7.19). Half of all movers remained in areas requiring a similar number of points while 17.64% of all movers went to areas requiring fewer points and 32.35% went to areas needing a higher level of points. Therefore if points required for entry is taken as being synonymous with the level of popularity of an area then the majority of movers within Granton are maintaining or improving their housing position in these terms.

From the figures given in Table 7.19 and Figure 7.7 it is evident that there was a large amount of movement into West Granton from other parts of the estate and 58.82% of all movers went from Granton to West Granton. This pattern appears to support the general finding for all the estates with a movement out of the older (particularly 1930s) housing to the newer housing in the areas of the estates which were built mainly in the 1960s. In Granton there is also evidence that the 1920s housing has maintained its popularity relative to that of the 1930s despite its age. Examples of the different types and ages of housing can be seen in the accompanying photographs (Figure 7.8).

In the four estates examined there was a varying amount of movement between and within parts, ranging from 15% between areas in Craigmillar to 53% in Niddrie. It had been thought that there would be a relationship between internal movement and the differential points levels within estates,

Table 7.19 Intra-Estate Movement in Granton

Area of Estate	No.Origins	No.Destinations	Balance	Average Points for Entry
Granton	23	18	-5	67
West Granton	6	12	+6	74
Boswall	5	4	-1	229

Approx Date Built	Area	Moves Within		Moves Between			
				To		From	
		No.	%	No.	%	No.	%
1939	Granton	12	70.58	6	35.29	11	64.70
1966/68	West Granton	2	11.76	10	58.82	4	23.52
1925	Boswall	3	17.67	1	5.88	2	11.76

Table 7.20 Intra-Estate Movement by Age of Housing

Approximate Date Built	To		From	
	No.	%	No.	%
1919-29	65	11.44	75 *	13.20
1930-39	74	13.03	109	19.19
1945-49	47	8.27	131 +	23.06
1950-59	149	26.23	130	22.88
1960-69	199	35.03	107	18.84
1970 onwards	34	5.98	16	2.82

* This includes 22 properties which were taken over by the Local Authority prior to Clearance.

\+ This figure includes 81 prefabs which were built in this period and subsequently redeveloped.

Figure 7.7 Intra-Estate Movement in Granton

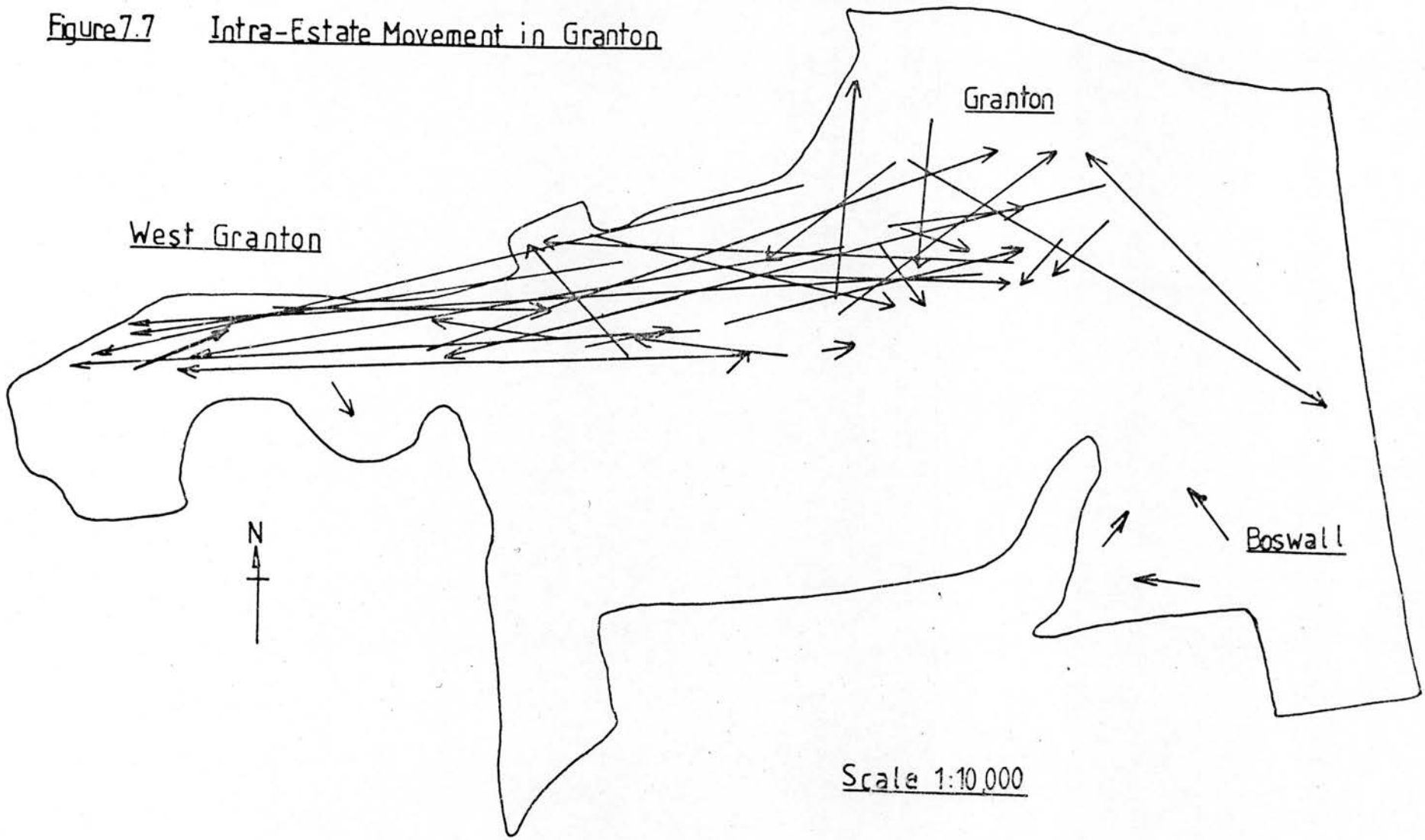


Figure 7.8

7.8a. Granton Medway

7.8b. Wardieburn Place West- Granton

7.8c. Royston Mains Place - Granton

7.8d West Granton Grove

7.8e. West Granton Terrace

7.8f. Boswall Terrace

however, only Niddrie and Granton showed any substantial internal variation in points levels.[19] In these two areas 87.34% and 82.35% respectively maintained or improved their positions in terms of the popularity of the part of the estate to which they moved. Only 12.66% in Niddrie and 17.64% in Granton moved to a less popular area. There was no indication that these were new tenants from shared accommodation as might have been supposed, for in both estates the proportion improving their housing position from shared accommodation was similar to that for transfers. In a Scottish Development Department study of Dundee a similar picture was found with 37% of those who moved obtaining a more popular district, 49% remaining in similarly rated areas and only 14% moving to less popular parts. Therefore although in general the difference in numbers moving to areas of high and low points was found to be not statistically significant, when these patterns were studied at the detailed level of individual estates there was a strong indication of movement to the more desirable parts of estates by intra-estate movement.

Age of Housing

Perhaps the clearest pattern to emerge from these

19. Most estates were fairly homogeneous internally in terms of their points levels and the four chosen here were picked because of their high numbers of internal movers which made comparisons more reliable, rather than their internal points differentiation.

detailed studies of individual estates was that of movement to the newer parts of the schemes from the older areas, this relationship was therefore examined for all intra-estate movers. Housing areas were grouped into six broad age categories as seen in Table 7.20. From this it can be seen that there was an overall movement out of older property, particularly that built in the 1930 to 1939 period and the prefabs of the 1945 to 1949 period. There was a slightly higher proportion of households moving into than out of 1950's housing but the principal gains were in the 1960 and 1970's developments. These findings are supported by the findings of other studies e.g. Murie (1974) and Watson (1973) who both noted a strong tendency to move to more recent property but also a substantial number of moves between dwellings of the same broad age groups.

It is worthwhile also noting that while the general pattern is a movement out of 1919 to 1929 built housing, when those older properties which were taken over by the Local Authority prior to closing orders and the re-housing of their occupants in the St. Leonards and Leith areas are omitted, there is an increase in the numbers living in such property from 9.33% to 11.44%. This substantiates earlier findings (Chapter 5) of the high popularity of these areas despite their age and lack of modern amenities. All differences were statistically significant, (Appendix 7.4).

From the investigations above it would appear that

by moving within an estate most households are able to improve their housing situation in terms of quality of environment and to obtain more modern and therefore higher amenity housing. It was also seen that many households were able to alter their space standards whether by moving to a smaller or a larger house. However, it is also likely that a proportion of those moving within an estate would have preferred to have moved to a different area. It has been suggested earlier that low status tenants could become trapped in low status property and that households who wish to move may be frustrated by institutional constraints. In this light it was decided to examine the realization of households' choices in those estates with the greatest amount of internal movement in an attempt to judge whether or not these short distance internal estate moves were truly fulfilling the wishes of the applicants.

Realization of Choice of Area.

Applicants for new tenancies or transfers may state as many choices of area as they wish on their application forms. In the choice of areas they are guided by the Housing Department who inform prospective tenants about the relative waiting times for different estates. The applicants must then decide which areas they prefer and in which areas they stand the best chance of being rehoused in a reasonable time period. As seen previously in Chapter 5, transfer tenants are normally in a better position than

Table 7.21 Realization of Choices

Estates

	First		Second		Third or Below		None	
	No.	%	No.	%	No.	%	No.	%
Niddrie	25	50.00	9	18.00	6	12.00	10	20.00
Gilmerton	55	68.75	11	13.75	5	6.25	9	11.25
Craigmillar	9	64.28	0	-	1	7.14	4	28.57
Granton	10	43.47	4	17.39	3	13.04	6	26.08
Muirhouse	12	42.85	11	39.28	4	14.28	1	3.57
West Pilton	13	46.42	6	21.42	3	10.71	6	21.42
Stenhouse	7	58.33	3	25.00	0	-	2	16.67

new tenants to wait for the more desirable areas. Therefore it is the realistic alternatives which are likely to be stated by applicants rather than their absolutely true preferences, although no doubt these will coincide in many cases. The majority of applicants gave only three or four alternatives and in some cases these were quite vague, such as "Southside" or "North" but in others they were as specific as to mention the street or even the house number which they wanted.

To investigate these preferences seven estates were taken which had over thirty internal moves in each. This included the four which were examined above, plus Muirhouse, West Pilton and Stenhouse. By excluding all exchanges where choice was prearranged and those who gave no stated preference 235 cases were examined. The results are seen in Table 7.21. In all estates over 40% of applicants achieved their first choice, ranging from 42.85% in Muirhouse to 68.75% in Gilmerton. The proportion of applicants who achieved none of their choices was perhaps surprisingly low, ranging from 3.57% in Muirhouse to 28.57% in Craigmillar. Thus for all the cases together over half (55.74%) fulfilled their first choice while only 16.17% achieved none of their choices. This means that almost 84% achieved rehousing in an area which they were prepared to accept from the outset. This would seem to suggest that there are not large numbers of tenants who are trapped in areas which they find undesirable. However in saying that, it must be remembered that this investigation only

considered those applicants who have been able to move at all and stated nothing about the fact that there may be large numbers of frustrated non-movers about whom nothing is known.

It is also noteworthy that those estates of Craigmillar, Granton, West Pilton and Niddrie which are generally held to be less popular are those with the highest number of tenants who are unable to fulfil their desire to move out. Craigmillar and Granton both have over a quarter of their within area movers who would have preferred to have moved out to other estates.

When those who were moving from shared accommodation and those who were transferring within estates are taken separately, it is interesting to find that while 60.38% of all transfer tenants achieved their first choice only 46.91% of those from shared accommodation did so. However, 19.48% of transfer tenants were unable to satisfy their desires for rehousing as regards area, while only 9.87% of those from shared accommodation were thus placed. This suggests that those from shared accommodation in an estate do have a reasonably strong preference for staying within the estate, close to the parental home in which they have been living. Transfer tenants who remain within an estate are more frequently frustrated inter-estate movers.

In general then it must be concluded that those who are moving within estates had a genuine desire to do so and whether the moves were for internal problems such as the lack of space, or external environmental influences

such as vandalism or fabric deterioration, the majority preferred to remain in the general location and improve their housing situation by a short distance move.

Summary and Conclusions

In this chapter those households who moved within estates were studied in an attempt to assess whether those who were moving over very short distances within neighbourhoods were in any way different from other intra-urban movers. As moves within a city are principally over short distances it was thought that this group of movers would be little different from any other. However, some important differences were noted between those households who were moving within estates and those who were moving between estates.

Estates were differentiated in terms of the numbers moving within them from shared accommodation, taken as a proportion of all households moving into them from this type of accommodation. They were also differentiated on the basis of different levels of intra-estate transfers. The less popular estates appeared to have the greatest proportions of those new tenants who were moving within estates while the pattern for transfers was less clear.

When the characteristics of these intra-estate movers were examined it was found, as expected, that those new tenants had younger household heads than the transfer tenants but it was also found that these same transfer tenants were generally older than those moving between

estates. This was thought to reflect the unwillingness of older householders to move away from areas in which they had established ties and were familiar with neighbours, facilities and services. This was supported when the duration of residence in previous dwellings was measured. Only half had lived under ten years in their past home and around 13% had lived there for twenty years or more. Those moving between estates had shorter durations of residence.

An essential difference among all groups lay in the reasons given for movement. New tenants wished to have their own home and this together with problems of overcrowding, lack of sex segregation and the strains of living with parents, accounted for the reasons for moving in the vast majority of cases from shared accommodation. Transfer tenants within estates were found to have moved for two groups of reasons. The first and most important category was related to changes in Family Life Cycle which created strains on space standards and the second group of reasons were those termed Involuntary. This group concerned those moves made as a consequence of the programmes of prefab re-development and rehabilitation which were carried out by the Local Authority Housing Department during the study period. For those moving between estates this latter group of reasons was of lesser importance and Personal/Health and Access reasons were stated more frequently.

Other differences which were noted between the two groups of intra-estate movers included differences in the number of persons in the household, with transfer tenants

having more one and two person households and also more large households but with fewer young dependants than was the case for new tenants. Transfer tenants were found to be moving out of three apartment homes to both smaller and larger dwellings while those from shared accommodation were concentrated in three apartment homes after moving.

When the physical pattern of moves within estates was examined there appeared to be a relationship between the popularity of a part of an estate and the inflow from within estate movers. Although the majority of estates were relatively homogeneous internally, in terms of the points required for entry, Niddrie and Granton which both had internal variation, showed that over 80% of movers maintained or improved their housing position in terms of the areal points distribution. From the detailed investigation of the pattern of moves in the four estates chosen, it was evident that there was a movement from the older to the newer housing areas and this was substantiated by an examination of all within estate movers.

It was felt that although the movement within estates appeared to satisfy the needs of householders by improving space standards and environmental quality, it was likely that some proportion of movers would have preferred to have moved to other areas. The realization of applicants' housing choices was estimated for the seven most active estates and it was found that 84% achieved rehousing in areas for which they had stated a preference. Transfer tenants were more likely to fulfil their first choice of

area than those from shared accommodation but transfer tenants were also more likely to have desired a move out of the estate since twice as many transfer tenants as new tenants failed to achieve any of their choices. Therefore despite the fact that fewer new tenants achieved their first choice, overall they were more likely to be satisfied to move within the estate. The fact that first choices were less often satisfied was probably due partly to the desire to live within the immediate vicinity of the shared dwelling which posed problems of suitable vacancies.

On the whole then these intra-estate moves appear to satisfy needs within the Local Authority housing system. Not only do they maintain community ties by facilitating young couples in their desire to live near to at least one of their parental homes but they serve as a source of re-adjustment for long term Local Authority tenants who wish to maintain their areal ties while improving or at least altering their housing and environmental quality.

It is the reasons which lie behind these moves which are examined in the following chapter. In this and other preceding chapters these reasons have been touched on briefly but in the following chapter they will be examined in detail for different types of households and for different areal scales of moves. The assessment of reasons for moving is one of the most problematic aspects of mobility studies for the difference between 'real' and 'stated' motives is one which is not easily overcome. The nature of the data here does to some extent preclude this

difficulty but presents other limitations which are equally troublesome as will be seen in Chapter 8.

CHAPTER 8

REASONS FOR MOVING

Introduction

In examining the reasons for moving it must be remembered that residential mobility is a highly complex phenomenon and that the reasons given are unlikely to reflect a single overriding consideration but rather to mirror a complex of related factors. Ladinsky (1967) notes that "... human ecologists have been properly suspicious of personal reasons for moving as indicators of true causes of mobility. Individual motives may have no connection with the prime environmental causes of movement and moreover an emphasis on motives displaces the focus from social to psychological causes. However, systematic data on reasons can shed further light on social determinants and therefore it is instructive to consider them." (Ladinsky, 1967, p 305)

This chapter will be concerned with these individual motives in the belief that they are of immense value in helping to illustrate how the process of residential mobility works. The correlates of residential mobility are well documented but few studies have looked at the individual reasons given by different groups for moving. Even if these reasons are psychological ones they are important, for psychologically dissatisfied householders will be keen to move no matter what the social pressures are behind this

discontent. Indeed this is the basis of much of the behavioural work which has been carried out on residential mobility. Wolpert (1966) gave a lead in this field with his argument that migration is a response to environmental stress factors.

It was in this light that the reasons given by council tenants for wishing to move were examined. Firstly an overall picture was obtained and then broken down to look at the differences and similarities between new tenants, transfer tenants and short distance (within estate) transfers. These groups were chosen for detailed examination because with all the differences already noted between the groups, it was felt that their motivations for moving would also be different. An analysis of how reasons varied by type of household was also carried out using life cycle stage, age of household head, number in the household, status of householder, socio-economic group, previous tenure and finally estate of destination as the discriminating variables. Before looking at these results it is important to take a brief look at other studies as their findings were important for the way in which this part of the study was structured.

Factors Influencing Residential Mobility

While it is evident that no single factor is able to explain all residential mobility, it is however possible to highlight some important influences which impinge on the decision to relocate, viz:

1) the household's stage in the life cycle,

2) the household's life style,
3) neighbourhood characteristics, both physical and social,
4) the type of housing occupied and its location, and
5) local and national government housing policies which affect access by different households to different types of housing.

This is by no means a comprehensive list of influences and applies primarily to the short distance intra-urban moves which are of interest here rather than the inter-community long distance moves which are more often stimulated by career mobility.

Stage in the Life Cycle

In Rossi's seminal study in 1955 he suggested that the major function of residential mobility was to enable families "... to adjust their housing to the housing needs that are generated by shifts in family composition that accompany life cycle changes." (Rossi, 1955, p. 9). Many of the earlier studies were based on aggregate data and were found to be inadequate when attempting to substantiate or refute theories based on behavioural concepts. Empirical research at the micro-level has been proved essential to test behavioural constructs (Popp, 1976). Although Rossi's study has been criticized on several grounds (Morgan, 1973), his study led the way for more detailed studies at an individual household level. Despite early contradictory findings by Leslie and Richardson (1961) the majority of later investigations have supported the

importance of life cycle stage in influencing residential mobility. Even Leslie and Richardson who found social mobility to be a more important stimulus to mobility than life cycle stage, did not refute Rossi's findings. They suggested rather that stage in the life cycle and career pattern acted as independent variables through the intervening variable of complaints (about the present dwelling) to stimulate mobility.

Similar ideas were put forward by Ladinsky (1967) in his study of the mobility of professional workers, when he suggested that life cycle exerted two distinctive influences on movement, one from the family side and one from the occupational side. If this idea is accepted and bearing in mind that career mobility tends to stimulate long distance moves, then family life cycle must be an important influence on short distance intra-urban mobility.

Speare (1974) too, found that age, income, duration of residence, city location and tenure characteristics were all indirect influences on mobility acting through the intervening variable of residential satisfaction to produce residential movement. Pickvance (1973) in his study using path analytic techniques, concluded that age has a direct effect on mobility apart from its effect through life cycle stage with which it is positively correlated and apart from the intervening variable of housing tenure with which it is also correlated. Thus it is evident from these studies and others

discussed elsewhere in this thesis (Chapters 2 and 9) that stage in the life cycle and age of household head are strongly associated with the propensity to move, especially at an intra-urban scale. However it is important that care is taken not to impute unjustified causal linkages between the variables merely on the basis of a high observed correlation (Moore, 1972).

Age of household head is probably the most important single variable related to whether a household will move or not. The younger the household head the more likely the household is to move. The importance of age was further confirmed by the fact that households in the same life cycle stage but with household heads of different ages varied in their levels of mobility, the younger being more mobile (Speare, 1970). Foote (1960) who examined only stage in the life cycle showed that it was those families in the 'child bearing' and 'child launching' stages which were the most likely to move (Foote, 1960, p. 99).

However, what is of the greatest importance is how these variables influence households and through which intervening variables they act to produce residential mobility. The mechanism at work is one of complaints about, or dissatisfaction with the present dwelling. In studies of individual households where the reasons given for moving have been analysed, it is widely found that space complaints are among the most frequent.

In Swansea it was found that 40% of local movers specifically stated dwelling size problems as the reason for their move (Herbert, 1973). In Glasgow too, Cullingworth (1968) found that the single most important reason for moving given by continuing households, was for a larger house. These space complaints reflect pressures from growing families as the number and ages of children increases through the typical family life cycle.

The importance of such changes in stimulating residential mobility was disputed by Murie (1974) because he found only 6% of moves by continuing households to be directly explained by a change in household composition. His figures for reasons for moving however appear to suggest otherwise (Table 4.6, p.55) for 11% said they moved because their previous dwelling was too large and 37% because it was too small. Thus 48% of all households cited space related problems in their reasons for moving and undoubtedly these were caused by qualitative if not quantitative changes in the household's composition. It may well be that growing children will cause as much, if not more, pressure on household space as the arrival of a new baby (Morgan 1973). Indeed in a study of Northampton it was found that over half the families who gave space problems as the major reason for their move had not experienced any increase in numbers while resident in their previous dwelling (Coupe, 1974). Murie's

dismissal of the importance of life cycle factors then must be seen as being based on the too narrowly defined concept of changing numbers in the household rather than taking both quantitative and qualitative factors into account. The importance of stage in the life cycle as an influence on mobility has been shown in studies of many different countries and types of housing and it is hoped to show here its importance in the residential mobility process within the Edinburgh public housing system.

Life-Style Influences

Stage in the life cycle and age of household head, no matter how important in stimulating mobility are not the only reasons for residential change. Variations in life style are also important in influencing the decision to move. In several studies there is evidence that not all families follow the typical family cycle and even among those who do, there are variations in patterns of housing use amongst those at similar stages (Murie, 1974; Speare, 1970; McCarthy, 1976). These life-style differences are most frequently reflected in tenure differences (Bell, 1956) and because of this the evidence of life-style differences is limited in the current study. Further, the high level of uniformity within the Local Authority sector of such variables as income and socio-economic status when compared to the population as a whole (see Chapters 3 and 4 above), tends also to limit any major variations in life style.

Neighbourhood Characteristics

A deteriorating external environment is likely to stimulate moves but internal household changes may also interact with the environment to produce dissatisfaction. Access to schools, for example, is unlikely to be very important to a young couple looking for their first home but may be of great importance once they have a child near school age.

Neighbourhood characteristics are seen as important in both the decision to move and the decision of where to relocate. In Swansea it was found that the quality of the built environment was important but also the sociability of the people (Herbert, 1973). In Dundee a Scottish Development Department study (H.M.S.O., 1976) showed that public sector consumer preferences appeared to be more strongly related to the evaluation of particular districts than to individual housing characteristics. These preferences appeared also to be based much more on perceived social prestige of areas, the social characteristics of residents, friendliness and neighbourliness rather than the physical characteristics of areas. This all leads to the differential demand for areas which was discussed above in Chapter 5.

Type of Housing

Type of housing inter-relates with family life cycle and life-style to produce an important influence on the residential mobility process. For example, although a

multi-storey flat may be ideal for a newly married, young couple who both go out to work, it becomes very unsuitable once they have young children who need to go out to play. They then become dissatisfied with their home and because of changes in both their life cycle position and their life-style now wish to change their type of housing and will probably express a preference for "cottage type" accommodation. However, if they are housed in the public sector it is unlikely that they will be able to fulfil their ambitions for such a dwelling and may have to accept a low-rise flat as the best alternative. The high proportion of council dwellings which are flats (Chapter 5) may therefore mean that type of housing is of less importance in stimulating mobility here than it is in the private sector, as the alternatives are limited.

Household location in the city in relation to workplace, schools, shops, family and friends and facilities in general, may lead to dissatisfaction and the desire to move to another area of the city. Despite early studies which indicated that access to workplace, in particular, was important in stimulating the desire for residential relocation (Carroll, 1952; Kain, 1962), recently it has become accepted that access generally is of minor importance in the explanation of residential change, (Daly, 1968; Stegman, 1969; Clark, 1970; Simmons, 1974). In the public housing sector in Edinburgh some acknowledgement of access

problems is made by the awarding of points to those wishing to be nearer to ill or disabled relatives and to shift workers and those wishing to return to an area in which they have lived for over six years (Letting Regulations, Appendix 5.6). However, these problems alone lead to very few moves and it may well be that access is more important as a secondary motive for moving than a primary motive. Clark (1970) in a study of Christchurch, New Zealand, found this to be the case for intra-urban movers there.

The influence of all these factors and others in stimulating mobility has been modelled by Brown and Moore (1970). In assuming that the residential dissatisfaction prompted by the influences mentioned above will lead to mobility, only one alternative of that behavioural model is being considered.[20] However, it is likely that there are many variations of the model which might feasibly occur in real life, although undoubtedly this version is the most common (Popp, 1976). The most significant deviation from the model which suggests that dissatisfaction will produce the decision to move followed by a search for a new dwelling, is the circumstance in which households are forced to move. In Erlangen, West Germany, Popp found that 23.3% of all the intra-urban moves from the 'Altstadt' (old quarter) were forced moves (Popp, 1976). Similarly, in Bristol some 21% of movers in the central city area had been forced to change their homes due to eviction or poor dwelling conditions (Short, 1978). Other studies

20 This model was discussed in detail in Chapter 2.

have also related the importance of forced moves in intra-urban movement with figures ranging from 9% to 19% (Watson, 1973; McCarthy, 1976; Clark, 1970; Butler et.al., 1969; Cullingworth, 1968; Murie, 1974).

Thus those who have no real choice in the decision to move (and often as a consequence, no real choice in where to relocate) appear to constitute a considerable proportion of movers in many different cities and countries. Not only is this a widespread significant phenomenon but it seems to be of even greater importance when moves into the Local Authority housing sector are examined. Cullingworth (1968) found that in Glasgow some 27% of all reasons given by council householders were involuntary ones, while in a study of the West of Scotland the comparable figure was 23% (Watson, 1973). Murie (1974) in Yorkshire found that 35% of all households in the Local Authority sector had been forced to move from their previous dwelling and the present study indicates a similarly high proportion of such movers in Edinburgh. These particularly high proportions of forced movers who are rehoused in the public sector are directly attributable to the large scale clearance schemes of the 1960's and early 1970's, together with the generally accepted role of the Local Authority to rehouse those families which were displaced. There has been little consideration of this type of household in past mobility studies and it is hoped that the present study will help to shed some light on the type of households

involved and the types of areas in which new homes are found. From the household's point of view then, if it is not forced to move by external influences (this may include economic and social influences as well as aspects of housing quality), it is likely to move home because of dissatisfaction with its present dwelling. This dissatisfaction, for those who intend to move within the urban area, is most likely to have arisen from pressures on space within the home or the need for a different type of housing due to family life cycle changes. It may also have arisen from changes in life-style and/or changes in neighbourhood character either real or perceived.

The decision to move however, is not always followed by an actual move. The ultimate factor controlling whether a move will take place or not is the household's ability to qualify for another home, whether in terms of financial ability to pay rent or obtain a mortgage or to qualify, in housing need terms, for a Local Authority tenancy or transfer. It is of course only this latter group of households which are considered here.

The supply and allocation of housing at any one point in time therefore ultimately determines the pattern of mobility in any city and it is within this framework that the housing decisions and preferences of individual households must be seen to operate.

The Influence of Local and National Government Housing Policies.

Studies which have been carried out into the availability of mortgages in the private sector and those which have looked at the allocation systems in public housing have all concluded that housing opportunities are not equal for all households with the same requirements. (Boddy, 1976; Short, 1978; Gray, 1976; Bird, 1976; Niner, 1975; Byrne, 1976; English, 1976) J.A. Rex, in 'The Sociology of a Zone in Transition', stated that ".... neither mortgages nor Council tenancies are available to all, so that either position is a privileged one as compared with that of the disqualified." (Quoted in Murie, 1974, p.118) Given then that not all households are eligible for public sector housing, the intra-urban mobility patterns which are found here must be seen to reflect the moves made by those who are successful in the eligibility stakes. Even of those who do obtain access to housing in the public sector, not all have the same chance of acquiring the type or size of house, or the area in the city which they would like. As seen earlier (Chapter 5), differential demand for estates means that only those who have the ability to wait for the housing of their choice will be able to realise their desires. Those with the least choice and in desperate need of housing are likely only to obtain the less popular areas. The relative waiting periods for different districts and house types can be seen as a

type of cost in the absence of a pricing system. This analogy cannot be taken too literally as administrative rules are also in force (HMSO, 1976).

It must be with the administrative framework and allocation system in mind, that the reasons given for moving are examined. In questionnaire studies, reasons given for moving are frequently suspect not only because of recall difficulties but also because of post hoc rationalization of moves by those involved. This is not a problem here, as all reasons were stated prior to any move and therefore should reflect the true motivations behind the desire for that move. However, what is an even more significant qualifcation must be placed on the reasons given here. In no way can the movers be seen to be free to move when or to where they want.

The decision to move by public sector households is just as likely to be attributable to the above influences as that made by any other household. Once the decision to move has been made, there the similarity ends. Local Authority tenants are not free to move if they are dissatisified or want to improve their environment, they must wait to be allocated a transfer or arrange an exchange. Thus, although it is likely that the reasons given will indicate to some degree those factors leading to the decision to move, the fact that a move will only be obtained if the household is judged to be eligible for such, means that the reasons may be couched within the categories of need as defined by the

Housing Authority. Those tenants who are better informed than others and those who are more aware of the system which operates to allocate homes will undoubtedly be able to 'play the system' to a certain extent. Thus a household wishing to move because of bad neighbours, but which incidentally has a slight shortage of space will play up the latter reason to obtain a more favourable response from the Local Authority. This is only one small simple example of a way in which a family may 'play the system', but it is undoubtedly something which does occur, the extent of which is unknown. (This was also recognised elsewhere, Niner, 1975, pp 103-105.) This type of manipulation of the housing allocation system is perhaps even more common by those applying to the Local Authority for a first tenancy. Young couples who continue to live with either set of parents after they are married stand a better chance of being rehoused than similar young couples who moved into privately rented accommodation on marriage. These chances are further enhanced if the young couple start a family thus causing overcrowding in the parental home. Although the majority of young couples who start their married life together in this way do not have any alternative, there is certainly a proportion who choose this course of action deliberately, to speed up their allocation of a council tenancy. All these facts must be borne in mind when examining the results given below but this should not be allowed to detract from the importance of

them as so little has previously been done in this field.

Methodology and the Typology of Reasons Used.

The data used here are those reasons stated by households at the foot of their application forms for rehousing or transfer. As they are stated before any move takes place they do not suffer from a posteriori rationalization by those involved. However, they do reflect the reasons given by those who have been successful in moving between 1963 and 1973 and do not reflect the reasons of potential movers or those who made the decision to move but were unsuccessful in that time period. Given that the reasons were extremely varied, often highly personal and frequently unique to individual applicants, the need for a classification scheme immediately arose. This was constructed both in the light of the literature considered above and the Housing Department's Letting Regulations. The detailed list is given in Table 8.1 but briefly this consisted of five categories under the broad headings of:

1) Family Life Cycle
2) Personal/Health
3) Social/Environmental
4) Access

and 5) Involuntary Reasons.

This scheme was used for both those entering Local Authority accommodation for the first time and for those

Table 8.1. Detailed Typology of Reasons Given for Moving.

Type 1 Family Life Cycle Reasons

1.1 House too small due to increased family size.

1.2 House too small due to lack of sex separation.

1.3 House too small due to wishing to accommodate old/invalid parent or relative.

1.4 Sharing accommodation with parents, would prefer own home.

1.5 House too large, too much space or too expensive.

1.6 House upstairs, want ground floor for children, want a garden.

1.7 Family split up, want own house due to separation of spouses.

1.8 Death of Householder.

1.9 Remarriage.

Type 2 Personal/Health Reasons

2.1 House too small due to medical reasons, need extra room, better facilities.

2.2 House upstairs and/or maisonette, unable to manage stairs due to age and/or ill health.

2.3 House's physical site unsuitable, too far from shops, bus stop, up a hill.

2.4 Due to ill health and/or old age need to live nearer to friends or relatives. Wish to move nearer to old and/or ill relatives.

2.5 Living in 'unhealthy' conditions e.g. central heating or damp aggravating asthma. Bad social conditions. All supported by medical evidence.

Type 3 Social/Environmental Reasons

3.1 House in multi-storey, want transfer due to over eight years' residence.

3.2 Work shifts, want quieter area, stair, own door or upstairs.

3.3 Trouble with or by neighbours.

3.4 House in "bad, poor, unsuitable" area, want to move.

3.5 House lacks basic facilities such as no inside w.c., no bath, no hot water, vermin etc.

3.6 Present housing arrangement unsuitable wish a change in type of tenure.

3.7 Do not want or unable to cope with the garden wish to move upstairs.

Table 8.1. Contd.

Type 4	Access
4.1	House too far from workplace, cannot get transport, too expensive, inconvenient.
4.2	House too far from parents, relations, friends, home area.
4.3	House has poor access to other facilities such as shops, schools, etc.

Type 5	Involuntary
5.1	Clearance Area, forced to move.
5.2	Closing order on property due to insanitary or dangerous.
5.3	Prefab redevelopment.
5.4	Eviction.
5.5	Fire damage and repairs.
5.6	Homeless (in emergency accommodation)
5.7	Overcrowding, forced to move.
5.8	Giving up tied accommodation due to termination of employment with landlord or death of spouse who held the tied accommodation.

transferring within the public sector. Most households stated at least one reason for wishing to move on their application form and many gave more than one. In part of the study it proved only feasible to use the first stated reasons but in most parts all reasons given were recorded. Similarly, due to manipulation problems and computer space and time limitations, only the five broad categories given above were used in the crosstabulation with all the household characteristics with the exception of stage in the life cycle where the full breakdown was used.

Reasons Given By All Local Authority Tenants.

When the reasons given by all movers between 1963 and 1973 are examined it is clear that those falling into the Family Life Cycle category are the most important, accounting for 32.14% of all reasons. Involuntary reasons explaining forced moves however also accounted for some 29.22% of the total with a further 23.68% falling in the Social/Environmental category. The other two groups of Personal/Health reasons and Access reasons were relatively less important accounting for only 10.35% and 4.60% of the total respectively. When these broad categories are broken down into their subdivisions as seen in Table 8.2, it is interesting to note that it was the desire for a change in tenure (reason 3.6) which headed the list accounting for 18.45% of all reasons given. No other single reason occurred as frequently

Table 8.2. Detailed Breakdown of Reasons Given by All Tenants.

Family Life Cycle Reasons.

Reason	No.	% Reasons	Reason	No.	% Reasons
1.1	375	9.85	1.2	66	1.73
1.3	27	0.71	1.4	377	9.91
1.5	169	4.44	1.6	64	1.68
1.7	122	3.20	1.8	16	0.42
1.9	7	0.18			

Personal/Health

Reason	No.	% Reasons	Reason	No.	% Reasons
2.1	50	1.31	2.2	171	4.49
2.3	14	0.36	2.4	66	1.73
2.5	93	2.44			

Social/Environmental

Reason	No.	% Reasons	Reason	No.	% Reasons
3.1	13	0.34	3.2	14	0.36
3.3	40	1.05	3.4	21	0.55
3.5	76	1.99	3.6	702	18.45
3.7	35	0.92			

Acess

Reason	No.	% Reasons	Reason	No.	% Reasons
4.1	121	3.18	4.2	46	1.21
4.3	8	0.21			

Involuntary

Reason	No.	% Reasons	Reason	No.	% Reasons
5.1	360	9.46	5.2	250	6.57
5.3	197	5.18	5.4	41	1.07
5.5	56	1.47	5.6	81	2.12
5.7	3	0.07	5.8	127	3.33

Detailed description of reasons given in Table 8.1.

Percentages are of all reasons given. Those reasons accounting for over 5% of the total are underlined.

and indeed the next most frequent only accounted for around half of this total. The high frequency of occurrence of this reason can be explained by the fact that those moving from privately rented accommodation and from shared dwellings almost invariably expressed a desire for a 'house of their own' when giving their reasons for applying for a Local Authority tenancy. This reason was felt to be best classified as a desire for a change in tenure. The importance of this factor has been seen elsewhere, for example, Donnison (1961) found that 12% of continuing households gave this reason and McCarthy in Wisconsin found 19.5% of all primary reasons for moving were for a change in tenure (McCarthy, 1976). In Yorkshire, 57% of Local Authority householders also stated this reason (Murie, 1974).

Other single important reasons were, the desire for more space, 9.85%, movement out of the parental home, 9.90% and a move due to clearance area status of previous dwelling, 9.46%. Again these figures are comparable with those found in other studies although the varying definitions of categories makes direct comparisons difficult. Other Involuntary reasons, such as moving because of a closing order on the previous dwelling and prefab redevelopment accounted for 6.57% and 5.18% respectively. All other reasons represented under 5% of the total. Within this total picture it is obvious that some reasons are being contributed to mainly by particular types of tenants. New tenants are obviously

giving reasons for wishing a Local Authority tenancy and for movement out of parental homes while prefab redevelopment as a reason for movement is the exclusive prerogative of those already holding a council tenancy.

A brief comparison can be made with those who moved into or within the public sector before 1963 and did not move again before 1973. When the reasons given by these householders are examined it is evident that many more gave Family Life Cycle reasons for moving (42.99%) and many fewer gave Involuntary reasons (18.63%) (Table 8.3). This lower figure for Involuntary moves is hardly surprising since the first major clearance area in Edinburgh, the Arthur Street one, began in 1961 only. The 1960's was the era of the large scale Comprehensive Development Areas and consequently any study of Local Authority housing involving this time period is bound to reflect the large number of households who were moved out of central areas and rehoused by the Local Authority. This too was the time when the Local Authority's own rehousing scheme from prefabs, built immediately post-war, was taking place. Thus probably not since the 1960's and certainly not before then, were so many people forced to move house in Edinburgh. Of the other categories considered only the Personal/Health group showed any noteworthy difference. In this group the frequency of reasons given was only half that found in the later period. This may reflect a change in Local Authority policy in this respect with a general easing

Table 8.3. Reasons Given by Those Moving Before 1963.

Family Life Cycle	42.99%
Personal/Health	5.08%
Social/Environmental	29.12%
Access	4.16%
Involuntary	18.63%

Table 8.4. Reasons Given by New Tenants.

Reasons	Shared Accommodation		Private Rental		Total	
	No.	%	No.	%	No.	%
Family Life Cycle	48	38.09	39	16.96	87	24.44
Personal/Health	7	5.56	17	7.39	24	6.74
Social/ Environmental	61	48.41	50	21.74	111	31.18
Access	1	0.79	2	0.88	3	0.84
Involuntary	9	7.14	122	53.04	131	36.79
	126		230		356	

The figures here are for all reasons given for a 20% sample of new tenants which was used earlier in Chapter 4.

in pressure from conventional housing amenity problems, particularly in recent years, allowing the consideration of these individual problems in a more favourable light.

Reasons Given by New Tenants.

This was first discussed as an intergral part of Chapter 4, but there only the first stated reasons were taken into consideration, rather than all given reasons and this has led to a slight variation in the figures involved in the two parts, although the relative importance of all groups of reasons remains constant.

When all reasons given for moving are examined for this group of tenants it is evident that those from privately rented and those from shared accommodation had very different motivations for moving into public sector housing, (Table 8.4). Over half (53.04%) of the reasons given by those moving from private rental accommodation were Involuntary reasons. This was made up mainly by moves from clearance areas, closing orders and tied accommodation, accounting for 25.22%, 17.82% and 6.08% respectively. This is in comparison with those from shared accommodation who had only 7.14% of their reasons in the Involuntary category. This is the major difference between these two types of new tenants, although the variations in the Family Life Cycle and Social/ Environmental groups is also worthy of note. While 38.09% of reasons given by those from shared accommodation are Family Life Cycle type, only 16.99% of those reasons

given by those from private rental are such. This is largely due to the very high proportion of those from shared accommodation who no longer wish to live with their parents and this is obviously not a complaint of those moving from private rental. The variation in the Social/Environmental category (Table 8.4), arises mainly from the desire for a change in tenure which seems to be much more strongly felt by those in shared accommodation. Access and Personal/Health reasons were of little importance to either group of new tenants, although both types of reasons were given slightly more often by those from private rental than those from shared accommodation, (Table 8.4).

Reasons Given by Transfer Tenants.

In comparing the reasons given by transfer tenants with all movers and new tenants, (Table 8.5), it is evident that Family Life Cycle reasons are of much more importance to this group of movers than to new tenants. This is probably a reflection of the importance laid on overcrowding and underoccupancy by the Local Authority in awarding points to potential movers. Personal/Health reasons are three times as frequently given by transfer tenants as new tenants while Social/Environmental are only one third as important. Access is ten times more often given by transfer tenants than new tenants but Involuntary reasons are noticeably less important, totalling only 23.19% for transfers compared

Table 8.5. Comparisons of Reasons Given by Different Groups of Movers.

Type of Reasons	New Tenants	Transfer Tenants	All Movers
	%	%	%
Family Life Cycle	24.44	37.76	32.14
Personal/Health	6.74	19.77	10.35
Social/Environmental	31.18	10.70	23.68
Access	0.84	8.56	4.60
Involuntary	36.79	23.19	29.22

with 36.79% for new tenants. The differences are important in highlighting the different housing situations of the two groups.

Once a household has gained access to the public sector and holds a tenancy it is likely that amenity levels in terms of the standard of accommodation will be relatively satisfactory. This means that Social/ Environmental reasons, in particular those related to tenancy or physical quality of housing will be of relatively less importance. Similarly, there is likely to be a decrease in the numbers of Involuntary reasons, with the exception of the role of prefab redevelopment which is discussed further below. With the diminished importance of the above features in stimulating moves, it is likely that other factors which were relatively less important before a Local Authority tenancy was obtained, will come to the fore, such as access to workplace, schools, shops and relatives.

The differences found in Family Life Cycle and Personal/Health groups can perhaps be better explained by the age structure of the two groups. New tenants are generally younger than those already within the public housing sector and generally have smaller sized households, (see Chapter 4 for details). It therefore seems natural that they will have fewer health related housing problems and it is these young couples who, several years after obtaining a council tenancy, find the need to move to a larger home due to increased

family size. Part of the movement of transfer tenants for Family Life Cycle reasons is due to a movement of older household heads out of family sized homes to one and two apartment O.A.P. dwellings, once their family have left home.

The detailed breakdown of the reasons given by transfer tenants can be seen in Table 8.6. From this it is clear that the need for a larger house due to increased family size (reason 1.1) is the single most important reason accounting for 15.70% of all reasons given. The third most important reason is the desire for a smaller house (1.5), 11.21% and these two, together with the other space reasons (1.2 and 1.3) account for a total of 31.40%. This compares with figures ranging from 9% to 43% in Niner's study and 22% for G.L.C. and 24.7% for Newcastle as found by Bird, (Niner, 1975; Bird, 1976). The second most important reason stated for wishing a transfer was because of prefab redevelopment. This single reason accounts for over half of the total Involuntary reasons given by transfer tenants but must be seen as being peculiar to the time period under study.

Comparisons with other studies are made particularly difficult by the many different classifications of reasons which have been used. However, Table 8.7 makes some broad comparisons with other suitable studies of Local Authority tenants. Variations between areas must be expected, not only because of the differences

Table 8.6. Detailed Breakdown of Reasons Given by All Transfer Tenants.

Family Life Cycle

Reason	No.	%	Reason	No.	%
1.1	220	15.70	1.2	43	3.06
1.3	20	1.43	1.4	0	-
1.5	157	11.21	1.6	65	4.63
1.7	11	0.78	1.8	11	0.78
1.9	2	0.14			

Personal/Health

Reason	No.	%	Reason	No.	%
2.1	34	2.43	2.2	108	7.71
2.3	12	0.86	2.4	54	3.85
2.5	69	4.93			

Social/Environmental

Reason	No.	%	Reason	No.	%
3.1	10	0.71	3.2	13	0.92
3.3	39	2.78	3.4	23	1.64
3.5	17	1.21	3.6	13	0.92
3.7	35	2.49			

Access

Reason	No.	%	Reason	No.	%
4.1	71	5.06	4.2	40	2.85
4.3	9	0.64			

Involuntary

Reason	No.	%	Reason	No.	%
5.1	23	1.64	5.2	20	1.43
5.3	188	13.42	5.4	2	0.14
5.5	54	3.85	5.6	36	2.57
5.7	0	-	5.8	2	0.14

Table 8.7. Comparisons With Other Studies of Reasons Given by Transfer Tenants.

Urban Areas	Type of Reason	%	Type of Reason	%
West Bromwich	Family Life Cycle	37.0	Personal/Health	25.0
Warley	(Space Reasons)	25.0	"	27.0
Wolverhampton	"	33.0	"	12.0
Halesowen	"	9.0	"	47.0
Stafford	"	43.0	"	11.0
Ludlow	"	41.0	"	15.0
Greater London	"	22.0	"	no equivalent
Newcastle	"	24.7	"	16.2
Glasgow	"	37.0	"	12.0
EDINBURGH	"	31.4	"	19.77
West Bromwich	Social/Environmental	23.0	Access/Location	8.0
Warley	"	27.0	"	14.0
Woverhampton	"	17.0	"	13.0
Halesowen	"	6.0	"	6.0
Stafford	"	22.0	"	9.0
Ludlow	"	18.0	"	6.0
Greater London	"	no equivalent	"	19.0
Newcastle	"	no equivalent	"	14.4
Glasgow	"	8.0	"	no equivalent
EDINBURGH	"	10.7	"	8.6
Glasgow	Involuntary	28.0		
EDINBURGH	"	23.2		
Others	"	no equivalents		

Sources: (Niner, 1975, West Bromwich; Table 6.1, p.121; Warley, Table 7.8, p.136; Wolverhampton, Table 8.10, p.157; Halesowen, Table 9.10, p.176; Stafford, Table 10.10, p.193; Ludlow, Table 11.10, p.210)(Bird, 1976; G.L.C. Table I, p.22; Newcastle, Table II, p.23)(Cullingworth, 1968, Glasgow, Table 38, p.49.)

Niner's figures are for those on the successful transfer list.

in allocation policies, but because of the composition of the transfer lists which in turn are influenced by the demography of the area and the desires and aspirations of the population wishing to move. Actual moves are also strictly controlled by the availability and type of accommodation for letting and the pattern of refusals. However, in general there seems to be a rough similarity in the magnitude of the various categories which suggests that Edinburgh is not particularly atypical in this respect.

This general pattern of transfer tenants' reasons for moving can be further broken down to shed light on the reasons given for moving between and within estates. It was felt that the reasons given by the two groups might reflect access problems in the former case and the readjustment of housing space in the latter. However, as can be seen in Tables 8.8 and 8.9, the greatest variation between the two groups is found in the proportions of Involuntary reasons given by each. For those transferring between estates only 17.35% of reasons given are Involuntary while 34.45% of the reasons given by within estate movers are in this category. When examined in detail in Table 8.8, it can be seen that for both groups the most frequently given reason for a forced move is because of prefab redevelopment. This accounts for 19.62% of within estate movers and 10.19% of between estate transfers. Almost twice as many households who are forced to move for this reason

Table 8.8. Reasons Given for Moving Between Estates.

Reason	No.	%	Reason	No.	%
Family Life Cycle					
1.1	156	16.92	1.2	28	3.04
1.3	15	1.62	1.4	0	-
1.5	100	10.84	1.6	45	4.88
1.7	9	0.97	1.8	9	0.97
1.9	2	0.22			
Personal/Health					
2.1	22	2.38	2.2	67	7.26
2.3	8	0.86	2.4	49	5.31
2.5	48	5.21			
Social/Environmental					
3.1	4	0.43	3.2	8	0.86
3.3	24	2.60	3.4	20	2.17
3.5	11	1.19	3.6	6	0.65
3.7	18	1.95			
Access					
4.1	68	7.37	4.2	37	4.01
4.3	8	0.86			
Involuntary					
5.1	6	0.65	5.2	10	1.08
5.3	94	10.19	5.4	2	0.22
5.5	13	1.41	5.6	35	3.79
5.7	0	-	5.8	0	-

Reasons Given for Moving Within Estates.

Family Life Cycle					
1.1	64	13.36	1.2	15	3.13
1.3	5	1.04	1.4	0	-
1.5	57	11.89	1.6	20	4.17
1.7	2	0.41	1.8	2	0.41
1.9	0	-			
Personal/Health					
2.1	12	2.50	2.2	41	8.56
2.3	4	0.83	2.4	5	1.04
2.5	21	4.38			
Social/					

Table 8.8. (Contd.)

Social/Environmental

Reason	No.	%	Reason	No.	%
3.1	6	1.25	3.2	5	1.04
3.3	15	3.13	3.4	3	0.62
3.5	6	1.25	3.6	7	1.46
3.7	17	3.55			
Access					
4.1	3	0.62	4.2	3	0.62
4.3	1	0.20			
Involuntary					
5.1	17	3.55	5.2	10	2.08
5.3	94	19.62	5.4	0	-
5.5	41	8.56	5.6	1	0.20
5.7	0	-	5.8	2	0.41

Table 8.9. Comparison of Reasons Given for Transfers Between and Within Estates.

	Transfers Between		Transfers Within	
Reasons	No.	%	No.	%
Family Life Cycle	364	39.48	165	34.45
Personal/Health	194	21.04	83	17.32
Social/Environmental	91	9.87	59	12.32
Access	113	12.25	7	1.46
Involuntary	160	17.35	165	34.45

are rehoused within their original estate area and do not have to move to another area. (Chapter 7 dealt with this in greater detail.) Those rehoused because of clearance or closing order or remedial repairs are also more frequently within estate movers. In the latter case two moves often occur with a short term temporary stay in nearby vacant accommodation while the repairs are carried out.

Access, as expected, was much more frequently given as a reason for moving between estates. The actual figures were eight times greater at 12.25%, for between estate transfers compared with 1.46% for within estate movers. This is primarily a reflection of access to workplace (7.37%) and access to friends and relations (4.01%) while location with regard to other facilities appeared to be of less importance.

Differences for the other three groups of reasons were less pronounced. Those moving within estates gave Social/Environmental reasons more often than those moving between estates, mainly owing to trouble with or by neighbours (3.13%) and wishing to move upstairs to be without a garden (3.55%). These problems were just as likely to be solved by moving a few blocks as by moving out of the area. However, of those moving between estates and giving Social/Environmental reasons the greatest percentage had done so because of incompatibility with neighbours (2.60%), while a further 2.17% specifically requested a move out of the area because of

its unsuitable character. As either of these are unlikely to carry much weight in a transfer application it is probable that other important 'need' factors were also present or that the Housing Department was truly aware of problems with neighbours, through numerous complaints having been filed in the past either by, or about, the applicant.

Personal/Health reasons were roughly equal for both groups of transfer tenants, with slightly higher numbers being given for between estate moves, 21.04% compared with 17.32%. The main reason within this group was the need to move into a dwelling with no external or internal stairs, owing to the inability to cope with them through arthritis or heart complaints. This single reason accounted for 8.56% of all reasons for within estate movers and 7.26% of between estate movers. For those moving between estates the need to be near relatives or friends arising from ill health was also an important feature while in both groups the need for specialized accommodation due to poor health was about equal. Health reasons are much more frequently given by successful transfer tenants than new tenants and although this may be a reflection of the age differentials mentioned above, it also reflects the high number of points awarded for medical priorities which are supported by a recommendation from the Medical Officer of Health.

The fact that Family Life Cycle reasons are more frequently given by those moving between estates was at first surprising as it had been thought that adjustments of space

could be easily satisfied by moving within an estate. However, it is those moving for more space due to increased family size (reason 1.1) which contribute almost all the difference between the two groups of transfer tenants. It may be that the distribution of vacancies in this time period contributed to this pattern but it is only possible to speculate on this matter. Those moving for a larger home owing to increased family size may well have had secondary reasons for wishing to move between estates, such as to improve job access or to be nearer to parents or friends but this supposition is again only speculative.

Of those moving to get a smaller dwelling, a slightly higher proportion moved within estates and this probably reflects a desire to maintain links which have been established in past years and which become of increasing importance as age increases. The lack of two apartment and other small dwellings may explain the amount of movement between estates for this group, as often the only chance of obtaining a smaller home would be to move to where vacancies were available. Movement between estates of this predominantly elderly group may also be associated with a movement to be nearer friends and grown up children in particular.

The major differences then between those transferring between and within estates are found in the Involuntary and Access categories. Twice as many involuntary reasons were given by those moving within estates while eight times as many access reasons were given by those who moved between

estates.

To summarize then, in examining the personal reasons given for moving by the different groups it has been seen throughout, that for those moving within the public housing sector, Family Life Cycle reasons are of prime importance. For new, first time Local Authority tenants it is those reasons which are classed as Involuntary and Social/ Environmental which are instrumental in obtaining their first tenancies. It must be recognized however that the marked importance of Involuntary reasons in both the movement of new tenants and transfer tenants is an aspect peculiar to the period studied. The 1960's were characterized by their large scale Clearance schemes and as the bulk of the old property is either removed or renovated such reasons will diminish to some extent for first time tenants. However, although the 1960s also saw the major programme of prefab redevelopment within the Local Authority sector and an increased volume of movement as a consequence of it, this internal improvement of the public housing stock will be an ongoing process. As the Local Authority property ages it will become increasingly in need of renovation, repair and even demolition in extreme cases, and therefore it is likely that involuntary moves, even if only temporary ones, will remain as an important source of mobility for transfer tenants. A clear illustration of the decreasing importance of Clearance schemes as a source of new tenants was found by Niner in her study of six Local Authorities in England (Niner, 1975). Of the six, although clearance needs were

given priority for letting, as they are in Edinburgh, the absolute priority given reflected the historical rather than the present situation for actual allocations given to clearance victims in 1974 was over 10% in only three cases. It is likely that a similarly reduced figure would be found at present in Edinburgh.

With the variations seen between different groups it was felt that it would prove worthwhile to examine the relationship of reasons given to households of different characteristics, for example, stage in the life cycle, age of household head, number in the household and so on. As each of these household characteristics have a minimum of four categories, only the five broad groups of reasons were used in a crosstabulation. This resulted in a great saving in computer time and space but also gave a simplified and more manageable tabulation than would have been obtained from a full crosstabulation. This is best illustrated by taking an example. If age of household head were cross-tabulated with the full thirty-two reasons given, 384 cells would result whereas using only the five broad groups of reasons the total number of cells is reduced to 60, which is still sufficiently detailed enough to be useful here, but is much more manageable.

Life Cycle Stage

As indicated above life cycle stage has been found to be vitally important in determining whether a family will move or not. What is less well established is why households

at different stages have a varying propensity to move. As has been seen in the present study, space requirements are of prime importance in this motivation, but these will obviously not be of equal influence at all stages. Foote (1960) recognized six stages in the life cycle in accordance with a scheme developed by U.S. census statisticians. He argued that as a family expands from a young couple to one with children the desire for more space and a home with a play area motivates many to move into home ownership. Often this move is to the newer suburbs and frequently the family purchase a home which is less than their ideal in space and amenity terms due to financial constraints. As time passes and the children grow, the family is relatively immobile but when the children reach a more independent age and the husband has acheived peak career and financial reward, it is then that the family will finally attempt to obtain that ideal home in the more select suburban areas. Thus frequently when space is most necessary, it is often unobtainable and once it has been achieved it is soon unnecessary as the children leave home and the post-child stage begins. Mobility in this stage is unlikely as too much space is never as convincing an argument for changing residence as too little and extra room for visitors is seen as important.

Once one spouse dies the move to a smaller house or to shared accommodation is often inevitable, but frequently delayed for a number of years, depending on the age, health and financial position of the widowed spouse. Often the

fear of losing their independence will encourage old people to remain in housing which is too large and generally unsuitable for their needs. Foote suggests that this is the modal pattern seen in housing trends in the U.S.A. but of course this excludes many variations such as unmarried adults, couples without children, broken marriages and low income families.

Generally, the scheme would apply best to a typical home-owning family here or in the U.S.A., however, as the present study is concerned with renters only, the motivation associated with home-ownership would be inappropriate here and the classification based on age of household head and size of family excludes many types of households who are housed by the Local Authority. Thus although this classification of life cycle stage has been frequently quoted in studies, an alternative was sought here because of its limited applicability in the current situation.

McCarthy put forward a wider ranging classification in his study of renters and home-owners in Wisconsin. The advantages of the scheme reported by McCarthy is that it includes single householders and disrupted households who do not follow the median sequence and a residual catch all category. The scheme was developed by the Housing Assistance Supply Experiment (HASE) in Brown County, Wisconsin and consists of the nine categories listed below in Table 8.10.

McCarthy's study investigated differential housing choices and he found that life cycle stage was important in determining similar preferences.

Table 8.10 Life Cycle Classification

Stage in Life Cycle	Definition
1) Young single head, no children	Household headed by a single adult (man or woman) under 46 years, no member under 18 years old.
2) Young couple, no children	Household headed by married couple, husband under 46 years, no other member under 18 years old.
3) Young couple, young children	Household headed by married couple, husband under 46 years, at least one other member under 6 years old.
4) Young couple, older children	Household headed by married couple, husband under 46 years, at least one other member between 6 and 18 years old.
5) Older couple, older children	Household headed by married couple, husband at least 46 years, at least one other member under 18 years old.
6) Older couple, no children	Household headed by married couple, husband at least 46 years, no other member under 18 years old.
7) Older single head, no children	Household headed by single person (man or woman) at least 46 years old, no other member under 18 years old.
8) Single head with children	Household headed by single person (man or woman) under 60 years old, at least one other member under 18 years.
9) All other	Residual category: most are households headed by single persons over 60 years old who live with married children and grandchildren.

Source: McCarthy, 1976, Table 1, p. 58.

Note: A single household head may never have been married; or may have been married but subsequently separated, divorced or widowed. A married couple consists of a cohabiting man and woman. Other household members need not be related to the household head but usually are and those under 18 are usually the children of the household head.

Housing choices were seen to be conditioned by the demographic configuration of the household as measured jointly by the marital stage and age of household heads, the presence of children in the household and the age of the youngest child. The exact stages were chosen on the premise that passage between stages corresponds to significant changes in household circumstances that affect housing needs and preferences. McCarthy's scheme does not vary drastically from that given by Foote but it does allow a greater flexibility which is invaluable here. According to Foote, the maximum mobility was found in the 'child bearing' and 'child launching' stages, which correspond to stages 3 and 5 in the HASE scheme. However in McCarthy's study mobility levels steadily decrease to a low at Stage 5 and in the present study too, those households in Stage 5 are one of the least mobile groups. This may be due to an inexact correspondence between the two schemes but it may also be related to the differences in behaviour between renters and owner occupiers.

Reasons for Moving as Related to Life Cycle Stage

Family Life Cycle reasons accounted for 31.52% of all the reasons given by those householders who could be classified by life cycle stage. However, this group of reasons is not of equal importance for all stages in the life cycle. They are most frequently given by those households who are in Stages 3 and 4. This is as might be expected from the fact that these two stages represent

young couples with young and older children respectively and moves at this time are likely to be readjustments of housing which may have been adequate at an earlier stage but which with the arrival of children and a growing family becomes unsuitable.

These findings agree broadly with McCarthy's, for although the classification of types of reasons does not permit an exact comparison, the predominance of space related reasons allows a degree of comparability. Similar to the American study, those households in Stage 8 (disrupted households) show an importance of changes in family circumstances and space requirements in stimulating mobility (Table 8.11).

Personal/Health reasons for moving account for 11.41% of all reasons and are cited most frequently by those in stages 5, 6 and 7, but particularly by those in Stage 6. These are older couples with no dependent children and the preponderance of health reasons given by this group is probably related to a desire for more suitable accommodation in terms of size, internal layout or external physical location owing to problems of ill health and physical disability.

Social/Environmental reasons are given most frequently by those in the first three stages of the life cycle and those in Stage 8. Households in Stage 2 are particularly frequent in citing such reasons and 51.49% of all reasons given by this group fall into this category. This reflects the movement of young couples into the Local Authority

Table 8.11. Crosstabulation of Reasons Given by Life Cycle Stage.

Life Cycle Stage	Type of Reasons: Family Cycle		Personal/ Health		Social/ Environ.		Access		Involuntary	
	No.	%	No.	%	No.	%	No.	%	No.	%
1	14	24.56	2	3.51	24	42.11	0	-	17	29.82
2	74	27.61	2	0.75	138	51.49	6	4.00	48	17.91
3	404	40.08	84	8.33	278	27.58	61	6.05	181	17.96
4	117	36.56	38	11.87	48	15.00	21	6.56	96	30.00
5	68	29.96	35	15.42	17	7.49	10	4.41	97	42.73
6	87	20.52	97	22.87	43	10.14	19	4.48	178	41.98
7	78	15.32	79	15.52	68	9.92	23	4.52	261	51.28
8	139	47.44	17	5.80	69	23.55	10	3.41	58	19.79
9	-	-	1	16.66	-	-	-	-	5	83.34

% figures are for each life cycle stage.

Totals for all Life Cycle Stages

Type of Reason	Number	%
Family Life Cycle	981	31.52
Personal/Health	355	11.41
Social/Environmental	685	22.01
Access	150	4.82
Involuntary	941	30.24

The variations in figures from those for all movers arises from the fact that not all households could be satisfactorily coded into life cycle stages.

sector for the first time from shared or privately rented accommodation, expressing a desire for "a home of their own", before starting a family, or because they have a young family. The frequency with which this type of reason is given by young single persons expresses their desire for independence from their family and similarly, those in Stage 8 who are mostly unmarried mothers and divorced or widowed household heads often wish to move out of the parental home.

Access only accounted for 4.82% of all reasons given and was most important for those in Stages 3 and 4. This is contrary to findings by McCarthy who noted that location only became important during and after Stage 5. The importance of access for the two groups in the present study reflects mainly a movement to be nearer workplace. This move is frequently made by new tenants who are working in Edinburgh but living outside the city but who are eligible to apply for Local Authority housing because of the location of their workplace. Another important aspect of moves for locational reasons is the movement to be nearer relatives and friends, particularly for those in Stage 3 of the life cycle. This may be a two-way process whereby couples with young children are seeking more readily available familial support while being nearer ageing parents to provide them with some reciprocal assistance.

Of those who are forced to move it is primarily households in Stages 5, 6 and 7 who are involved. Forced moves accounted for 30.24% of all reasons given and the

present findings support those of McCarthy, in that it is those households in life cycle stage 7 who are the most vulnerable in terms of being forced to move. However, the underlying causes of these involuntary moves are very different in the two studies. McCarthy suggests that with the death of one spouse the other is unable or unwilling to maintain their home and thus involuntary moves are forced upon them. In Edinburgh, the evidence points to the fact that these older single household heads with no children were forced to make Involuntary moves because of clearance or closing orders on their property, rather than through personal circumstances. Of those in life cycle stage 7 who move within the Local Authority housing sector only 21.82% move for Involuntary reasons, however, of those moving into the Local Authority sector some 69.87% gave Involuntary reasons. This then refelcts the importance of clearance and closing orders as a positive influence enabling these older, single household heads to obtain entry to modern Local Authority housing. The intake of this group for other reasons is small, a fact which is probably related to the emphasis on rehousing young families by Local Authorities (Niner, 1975).

In examining the relation of reasons to life cycle stage it has been seen that the general results bear some similarity to those found by McCarthy in the U.S.A. However, the importance of these findings lies more in the fact that they highlight the variations in reasons for

moving by households at different stages of the life cycle. Therefore because the majority of movers are young households with children (stages 3 and 4) and because they move predominantly for reasons associated with space problems, then it is hardly surprising that overall Family Life Cycle Reasons are the most important. As there are fewer movers at other life cycle stages, then other reasons appear as being less important. The high mobility of disrupted households (stage 8) also contributes to the importance of Family Life Cycle Reasons as over 47% of all the reasons given by this group are in the former category. The three stages of 3, 4 and 8, together account for over 67% of all Family Life Cycle reasons and over 52% of all movers. From this then, it must be concluded that Family Life Cycle reasons are a real and important influence on mobility.

The importance of Involuntary moves, as explained above, may be specifically related to the period of study but they are also related to certain stages of the life cycle (5, 6 and 7). This is partly due to the fact that these older households were those mainly involved in the programme of prefab redevelopment but is also related to the high numbers of those in stage 7 who became new tenants after clearance or closing orders on their old property.

The other categories of reasons were of less importance but again were found to be related to specific stages in the life cycle with Social/Environmental reasons being associated with stages, 1, 2 and 3 and Personal/Health

being given most often in stages 5, 6 and 7. Access was of minor importance in all stages but the highest proportions of such reasons were given by those in stages 3 and 4.

Age of Household Head

Although age of household head and stage in the life cycle are correlated empirically they are logically distinct concepts. Pickvance (1974) found that age had an effect on mobility apart from its effect through life cycle stage and Long (1972) showed that age of household head was a more important variable than life cycle stage in determining mobility. It is therefore worthwhile to examine the relationship between age of household head and reasons given for moving separately from the above examination of life cycle stage.

Age of household head was formed into twelve categories and the proportion of each reason given by a particular age group can be seen in Table 8.12. Family Life Cycle reasons are the most important type of reasons for all age groups except those between 65 and 69.9 years where Involuntary reasons are slightly more important. They are particularly important for those households whose heads are under 20 years of age and although this group is not numerically large, the fact that over half give such reasons is worthy of note. After 50 years of age the importance of such reasons declines slightly.

Personal/Health reasons are of the greatest importance for those over 70 years of age but are important for

Table 8.12. Crosstabulation of Reasons Given by Age of Household Head

Age Groups	Type of Reasons: Family Cycle		Personal/ Health		Social/ Environ.		Access		Involuntary	
	No.	%	No.	%	No.	%	No.	%	No.	%
15-19.9	33	56.89	1	1.72	17	29.31	0	-	7	12.07
20-24.9	222	44.14	13	2.58	183	36.38	10	1.98	75	14.91
25-29.9	285	42.92	19	2.86	203	30.57	25	3.76	132	19.87
30-34.9	276	43.80	34	5.39	160	25.39	34	5.39	126	20.00
35-39.9	253	46.33	43	7.87	110	20.14	28	5.12	112	20.51
40-44.9	218	44.12	30	6.07	69	13.96	32	6.47	145	29.35
45-49.9	195	47.44	25	6.08	49	11.92	14	3.41	128	31.14
50-54.9	150	41.66	24	6.66	29	8.05	16	4.44	141	39.16
55-59.9	135	39.13	28	8.11	33	9.56	22	6.37	127	36.81
60-64.9	127	39.93	32	10.06	32	10.06	6	1.88	121	38.05
65-69.9	104	38.09	32	11.72	20	7.32	2	0.73	115	42.12
70 +	115	40.35	46	16.14	14	4.91	4	2.07	106	37.19

Percentage figures are for reasons given by each age group.

all household heads over 60 years old. This type of reason is of very little importance to those in the younger age groups and increases fairly steadily with age, starting to account for over 5% of all reasons for those of 30 years and over.

Social/Environmental reasons are almost the sole prerogative of the younger household heads, being particularly important for those in the 20 to 30 year old age groups and becoming markedly less frequent after 40 years of age. This mainly reflects the large numbers of new tenants coming from shared accommodation in this age range.

Access is of little importance to the very young or the very old but it is of greater importance in stimulating mobility between the ages of 30 and 45 and again between 55 and 60 years of age. The younger group are mainly moving for reasons of access to workplace, for this is the age when jobs are normally consolidated and final homes are obtained. Part of the movememnt may also be to be nearer friends and relations and it is likely that this, rather than job access, is the motivating force for those in the older age group.

It was interesting to find that Involuntary moves are not as uniformly distributed with age as might have been expected. They are most frequently given by those aged 50 years and over and are of little importance before the age of 40 years. The age groups most involved were those who were living in privately rented accommodation or

owner occupied dwellings which were demolished through clearance or those Local Authority tenants who were living in prefabs or property in need of renovation.

The distribution of all reasons by age groups was tested against a theoretical distribution which showed no relationship with increasing age. In all cases the difference from this theoretical distribution was found to be significant at the 0.01 level. (Details of the Kolmogorov-Smirnov one sample (two tailed) tests can be seen in Appendix 8.1.)

Thus for all types of reasons the relationship varies with age. Life Cycle reasons are given predominantly by younger and middle aged household heads while Personal/Health reasons are given by older householders. Social/Environmental reasons seem to be the prerogative of younger households while Access appears to be most crucial in middle age with job consolidation and the desire to be near to friends and relations. Involuntary reasons are the most evenly distributed by age although they are less important to the very young and most frequent in the older age groups.

Number of Persons in the Household

The reasons given by households of different sizes can be seen in Table 8.13. Reasons in the Family Life Cycle category are much more frequently given by those households with 7, 8 or 9 members than by smaller families or larger ones, (the numbers are not significant for very

Table 8.13. Crosstabulation of Reasons Given by Number in the Household

No. in Household	Type of Reasons: Family Cycle		Personal/ Health		Social/ Environ.		Access		Involuntary	
	No.	%	No.	%	No.	%	No.	%	No.	%
1	343	45.01	51	6.69	98	12.86	8	1.04	262	34.38
2	426	39.96	87	8.16	222	20.83	31	2.91	300	28.14
3	417	37.70	65	5.87	293	26.49	53	4.79	278	25.13
4	361	39.67	65	7.14	183	20.11	54	5.93	247	27.14
5	255	47.39	35	6.50	82	15.24	27	5.02	139	25.84
6	173	55.98	19	6.15	30	9.71	16	5.17	71	22.97
7	104	71.23	3	2.05	14	9.58	3	2.05	22	15.07
8	42	75.00	2	3.57	4	7.14	1	1.78	7	12.50
9	22	73.33	2	6.66	0	-	0	-	6	20.00
10 +	12	50.00	0	-	2	8.33	1	4.16	9	37.50

Table 8.14. Crosstabulation of Reasons Given by Civil Status of Household Head

Status	Type of Reasons: Family Cycle		Personal/ Health		Social/ Environ.		Access		Involuntary	
	No.	%	No.	%	No.	%	No.	%	No.	%
Married	1288	38.25	244	7.25	749	22.25	174	5.17	912	27.08
Single	141	37.50	21	8.24	78	20.74	0	-	136	36.17
Widowed	483	60.90	46	5.80	37	4.66	16	2.02	211	26.60
Divorced	244	58.51	18	4.32	67	16.06	5	1.19	83	19.90

large families). Those households of 2, 3 and 4 persons gave Family Life Cycle reasons the least often and this may be related to the fact that the largest proportion of public sector housing is of three apartments and therefore space problems are likely to be less pressing for these smaller sized households, only beginning to be of real importance from 5 persons upwards. The higher frequency of such reasons given by 1 person households reflects the other side of the problem with the demand for movement into smaller dwellings.

Personal/Health reasons were given most frequently by 2 and 4 person households. The former is associated with elderly couples moving for health reasons for one or both partners. It is more difficult to say why 4 person households should give these reasons with increased frequency but it may be related to movement to be near ill or aged relations or perhaps due to childrens' medical problems.

Social/Environmental reasons predominate in the 2, 3 and 4 person households as would be expected from the high proportions of those from shared accommodation with families in this size range.

Access reasons are relatively evenly distributed over all household sizes but the slight peaking at 4 to 6 person households is probably related to the age of the household heads rather than to the number in the household.

Involuntary reasons are given most often by 1 person households and those households of 10 or more persons.

As 1 person households have a relatively low priority to be rehoused by the Local Authority then it is obvious from these figures that clearance and closing orders form an important channel through which these single households are rehoused from the private rental sector. This substantiates the findings of the life cycle stage investigation. It is likely that widowed household heads are also involved here, especially in transfers from prefabs, but as will be seen below, it is the single (never married) people who are the most affected by such reasons.

The higher figure for very large households (over 10 persons) again reflects the importance of the private rental sector in initially housing these extreme sizes of households and their port of entry into the public sector through clearance and closing orders.

Status of Household Head

The civil status of household heads was examined in relation to the reasons given for moving (Table 8.14). Family Life Cycle reasons, although the most important in all cases, were given by a higher proportion of widowed and divorced household heads than married and single householders. Both of these indicate the importance of a split in family life leading to rehousing, although this is more true of divorced than widowed householders. Divorced household heads are most often women with custody of children (if any) and

are often moving back into the Local Authority from parental homes. Widowed householders are more often transfer tenants moving to obtain a smaller home after the family has split up and one spouse has died. This readjustment of housing may be delayed for a considerable time after the initial break up of the family, in contrast with divorced household heads who are more likely to move as a direct and immediate consequence of their separation.

Personal/Health reasons are not particularly related to any one group although they are given slightly more often by single householders.

Social/Environmental reasons are of least importance to widowed household heads and of greatest importance to married and single householders. This is connected with the variations in age structure of the different groups, with single and young married couples moving out of parental homes and taking on their own tenancies in the public sector. It is perhaps surprising that divorced household heads did not feature more strongly in this category.

Access again was of minor importance to all groups but as a reason for moving it was given most often by married household heads.

Involuntary reasons were most strongly represented by single householders. This, together with the importance of health reasons for this group, gives an indication of the problems which single people face in

obtaining Local Authority housing. As it is those single people who are successful in gaining a Local Authority tenancy or a transfer who are being examined here, the fact that they give above average proportions of medical and clearance and closing order priorities as reasons for moving, indicates that strong reasons (high numbers of points) are needed to back a successful application.

Reasons by Socio-Economic Group

Socio-economic groupings have been found to be of little importance in other parts of this study in illustrating differences between groups, (Chapters 4, 5 and 7). However, some interesting relationships between socio-economic groups and the reasons given for moving were found, (Table 8.15).

Family Life Cycle reasons feature highly for all socio-economic groups but particularly for those in S.E.G. 6 (junior non-manual workers), S.E.G. 9 (skilled manual workers), S.E.G. 11 (unskilled manual workers) and particularly S.E.G. 12 (self-employed, non-professional workers). This may well be related to age or stage in the life cycle rather than any inherent socio-economic difference.

Health reasons are most frequently given by S.E.G. 8 (foremen and supervisors - manual) and (ex) members of the armed forces (S.E.G. 16). It is difficult to say why those in S.E.G. 8 should be particularly prone

Table 8.15 Crosstabulation of Reasons Given by Socio-Economic Group of Household Head

Socio-Economic Group		Type of Reasons: Family Cycle		Personal/ Health		Social/ Environmental		Access		Involuntary	
	No.	%	No.	%	No.	%	No.	%	No.	%
2	2	66.66	-	-	1	33.33	-	-	-	-
4	3	50.00	-	-	2	33.33	-	-	1	16.66
5	39	35.13	5	4.50	23	20.72	13	11.71	31	27.92
6	216	40.37	32	5.98	134	25.04	33	6.17	120	22.43
7	62	38.27	6	3.70	32	19.75	7	4.32	55	33.95
8	28	37.84	6	8.11	13	17.56	8	10.81	19	24.67
9	618	41.04	87	5.77	355	23.57	68	4.51	378	25.09
10	196	38.89	23	4.56	110	21.83	31	6.15	144	28.57
11	358	44.47	44	5.46	139	17.26	22	2.73	242	30.06
12	25	52.08	2	4.16	7	14.58	2	4.16	12	25.00
16	15	27.27	4	7.27	10	18.18	0	-	26	47.27

For details of socio-economic groups, see Appendix 8.3.

to health problems which cause mobility but this again may be connected with age structure. Those members of the armed forces who have obtained a Local Authority tenancy are mostly ex-members who have been discharged at the end of their service or those who have been discharged through ill-health which is supported by the higher level of health reasons given by this group.

Social/Environmental reasons are given most often by those in S.E.G. 6 (junior non-manual) and S.E.G. 9 (skilled manual workers) and this may be related to a youthful age structure in these groups and the probability that many of them have moved from shared accommodation.

Access reasons provided the most interesting relationship with socio-economic status. Those in the supervisory groups (S.E.G. 5 and 8), both manual and non-manual, gave access reasons most frequently for having moved. The fact that access, to workplace in particular, was relatively more important for these groups was probably due to the relative importance and stability of their jobs. It may also have been related to the necessity for adaptable and longer working hours by these groups and often the need for an earlier start.

Involuntary reasons are most frequently given by members of the armed forces who have moved from tied accommodation on the completion of service but who generally apply while still in the forces to ensure that they have a home to go to when their discharge comes through. The higher frequency of Involuntary reasons given by S.E.G. 7 (personal service workers) is also related to the movement out of tied accommodation on the cessation of employment. This group includes housekeepers and

caretakers who frequently have tied accommodation which must be given up on termination of employment.

Reasons Given by Non-Economically Active Household Heads

When comparing the reasons given by the three non-economically active groups of household heads (Table 8.16), it can be seen that Family Life Cycle reasons are by far the most important for those who are housewives (72.08% of all reasons given by this group are in this category). This is two times as great as for those who are unemployed and undoubtedly reflects the circumstances under which female household heads come to move. Generally this will be because of the split up of the family by separation or divorce or because of the death of the male householder. This is supported by the high proportion of Family Life Cycle reasons given by divorced and widowed household heads (Table 8.14). This group is also likely to include unmarried mothers who wish to set up a home on their own away from the parental household.

Health reasons are important to those who are retired and unemployed and are markedly higher than for any socio-economic group of household heads who are economically active. A total of 16% of the reasons given by unemployed household heads were Personal/Health reasons and this is almost twice the highest level given by any economically active socio-economic group. It can be seen from this that many unemployed household heads have a genuine health problem which in many cases may be the reason for their

Table 8.16 Crosstabulation of Non-Economically Active Household Heads with Reasons Given

Household Head	Type of Reasons									
	Family Cycle		Personal/ Health		Social/ Environmental		Access		Involuntary	
	No.	%	No.	%	No.	%	No.	%	No.	%
Housewife	297	72.08	10	2.43	38	9.22	3	0.73	64	15.53
Retired	217	41.41	78	14.88	34	6.49	4	0.76	191	36.45
Unemployed	73	36.50	32	16.00	32	16.00	4	2.00	59	29.50

unemployed status. The fact that health reasons are also given frequently by retired household heads was expected due to the medical problems associated with this older age group, such as heart complaints, immobility through arthritis and many other difficulties which often require a move to smaller and particularly low level accommodation.

Social/Environmental reasons were given by a higher proportion of unemployed household heads than by housewives or retireds. However, this category of reasons and Access reasons were given less frequently by these non-economically active household heads than the general level found for socio-economic groups who were economically active and therefore the differences were not seen as being particularly significant.

Involuntary reasons were given very infrequently by housewives but relatively often by O.A.P.s. This is related to age structure, with many of the older household heads in older property both in the Local Authority and elsewhere and therefore more likely to be forced to move for rehabilitation, renovation, clearance or closing order. Also important in this respect are the forced moves from tied accommodation on retiral.

Reasons Given by Previous Tenure and Type of Move

Five types of previous tenure were crosstabulated with the five categories of reasons given and produced some interesting results. Family Life Cycle reasons were most often given by those from shared accommodation and those

transferring within the Local Authority sector while Personal/Health reasons were mainly the prerogative of transfer tenants (Table 8.17). Social/Environmental reasons were mainly given by those from shared and privately rented accommodation, reflecting their role for new tenants. Access was relatively unimportant for all groups, although the highest percentage was given by those moving within the Local Authority sector. Involuntary reasons were 85% of all reasons given by those moving from tied accommodation while 69% of past owner occupiers also quoted this type of reason for moving.

The findings here generally lend support to those related to the other characteristics which were examined above. The importance of Involuntary reasons to owner occupiers is perhaps worthy of note in that it reflects the lack of opportunity for entry into the public sector by owners under any other circumstances. It is indeed only recently that owners have been genuinely considered for rehousing in the public sector, however, only a small proportion would seriously consider such a move and the demand from this group is limited.

Allied to the findings here was an examination of reasons related to type of move. This specifically dealt with the three categories of Transfer, Exchange and Rehousing - the first two being moves within the public sector and the third encompassing all new tenants from various housing situations. The total figures involved in the classification vary from those given in moves from

Table 8.17 Crosstabulation of Reasons for Moving by Previous Tenure

Previous Tenure	Type of Reasons: Family Cycle		Personal/ Health		Social/ Environmental		Access		Involuntary	
	No.	%	No.	%	No.	%	No.	%	No.	%
Council	1214	57.41	218	10.32	122	5.78	111	5.26	446	21.13
P. rental	408	25.58	84	5.27	473	29.65	61	3.82	569	35.67
Shared	474	55.57	14	1.64	301	35.28	12	1.41	52	6.09
Owner occ.	46	19.91	11	4.76	9	3.89	5	2.16	160	69.26
Tied	5	3.94	2	1.57	9	7.08	3	2.36	108	85.04

Table 8.18 Crosstabulation of Reasons for Moving by Type of Move

Type of Move	Type of Reasons: Family Cycle		Personal/ Health		Social/ Environmental		Access		Involuntary	
	No.	%	No.	%	No.	%	No.	%	No.	%
Transfer	361	35.81	169	16.76	69	6.85	39	3.87	370	36.71
Exchange	193	53.02	43	11.81	52	14.28	73	20.05	3	0.82
Rehoused	954	32.59	115	3.93	810	27.67	83	2.84	965	32.96

previous tenures, because of technical aspects of the computer program. This excludes any case from the analysis where the details for either or both of the crosstabulation variables are missing.

Family Life Cycle reasons were again of the greatest overall importance but were particularly given by those who were exchanging properties. Personal/Health reasons were again more often given by those moving within the Local Authority sector than those being rehoused (Table 8.18).

As expected the Social/Environmental category was most heavily subscribed to by those who were being rehoused from shared dwellings and private rental accommodation. Not only is the demand for a change of tenure great by these households but they are also the most likely to suffer from a lack of basic facilities and modern amenities.

Access was found to be of minor importance to those moving by transfer or being rehoused but was given by one in five of those exchanging homes, accounting for 20.05% of all reasons given by exchangers. Obviously, to those households which wish to locate in a different area of the city whether because of access to job, schools, shops, relatives or friends the system of exchanges plays a vital part in the realization of those desires. It is evident from the Local Authority Letting Regulations, that there is only a limited priority given to those wishing to move for access reasons. For example, shift workers may be awarded 3 points to aid their application for a move to a more suitable house or location while a maximum of 7 points

may be awarded to those wishing to move nearer to relations because of sickness or disablement. The ordinary householder then who would prefer to live elsewhere is unlikely to be able to do so, especially if no other home circumstances add to his 'need' priority, unless a suitable exchange can be arranged. This naturally discriminates against those who live in the less popular areas for they are unlikely to find anyone who is willing to move out of a better area into a poorer one. This problem was recognized by Bird in London and Newcastle and by the Scottish Development Department in a study of Dundee (Bird, 1976; H.M.S.O., 1976).

Involuntary moves are obviously negligible for those who are exchanging homes as there are very few cases of the Local Authority Housing Department forcing households to exchange because of overcrowding and none of the other Involuntary reasons are liable to involve an exchange. As was seen above, the Involuntary moves within the Local Authority sector are mainly due to prefab redevelopment and other rehabilitation. Few tenants who are evicted from the public sector immediately obtain another tenancy in that sector, although many eventually do, therefore this is not a source of many Involuntary moves. The Involuntary reasons given by new tenants have been discussed in detail above and will not be examined again here.

Areas of Destination by Reasons Given

The final part of this study of reasons given for moving was an attempt to see whether certain estates were

more likely to be the recipients for particular types of movers than others. This crosstabulation gave 150 cells to be examined, so it was felt that the most succinct way of looking at the patterns obtained was to rank the estates by the proportion of their residents who gave each category of reason. The rankings were then subdivided into quartiles and the upper quartiles (top 7) and the lower quartiles (bottom 7) were then examined in detail to see if any patterns emerged (Tables 8.19 and 8.20).

Upper quartile rankings by reasons were very interesting particularly when these were compared with the popularity and points required for entry rankings from Chapter 5 (Tables 5.7 and 5.17). Of those estates which had the highest proportions of those moving for Family Life Cycle reasons, four of the seven were defined as unpopular and the remaining three, the Inch, Lochend and Granton, although above the median for points required for entry, were not near the popular end of the spectrum. Thus there appeared to be a tendency for those with life cycle (mainly space) problems to be allocated to the less popular estates. This is supported by the fact that those with life cycle problems tend to be in the younger age groups and generally the unpopular and less popular estates have a predominantly youthful age structure.

Of those estates with the highest proportion of their residents citing Personal/Health problems, three are popular, one unpopular and one each in intermediate popular and

Table 8.19 Estates in Upper Quartiles by Percentage of Reasons Given of Each Type

Family Life Cycle		Personal/Health		Social/Environmental	
West Pilton	(55.50%)	Northfield	(12.50%)	Craigmillar	(37.50%)
Broomhouse	(54.46%)	Newhaven	(11.54%)	West Mains	(34.09%)
Southhouse	(54.33%)	Saughtonhall	(10.00%)	Sighthill	(29.73%)
The Inch	(52.17%)	Gracemount	(9.16%)	Wester Hailes	(27.91%)
Niddrie	(51.49%)	West Mains	(9.09%)	Longstone	(25.67%)
Lochend	(51.27%)	Craigmillar	(8.69%)	Drylaw	(25.00%)
Granton	(51.25%)	Lochend	(8.49%)	Gorgie	(23.07%)

Access		Involuntary	
Wester Hailes	(7.86%)	St. Leonards	(62.85%)
Portobello	(7.41%)	Central	(44.44%)
Southfield	(7.27%)	Prestonfield	(43.48%)
Broomhouse	(6.93%)	Northfield	(39.27%)
Clermiston	(5.62%)	Leith	(39.27%)
Drylaw	(5.00%)	Gilmerton	(39.14%)
Saughtonhall	(5.00%)	Newhaven	(34.62%)

Table 8.20 Estates in Lower Quartiles by Percentage of Reasons Given by Each Type

Family Life Cycle		Personal/Health		Social/Environmental	
St. Leonards	(14.28%)	Gorgie	(1.92%)	Central	(3.70%)
Craigmillar	(23.37%)	St. Leonards	(2.85%)	Prestonfield	(5.79%)
West Mains	(34.09%)	Broomhouse	(2.97%)	Broomhouse	(10.89%)
Gracemount	(32.06%)	Gilmerton	(3.48%)	Northfield	(11.60%)
Northfield	(34.82%)	West Pilton	(4.00%)	Lochend	(12.18%)
Sighthill	(37.29%)	Oxgangs	(4.81%)	Saughtonhall	(12.50%)
Leith	(36.07%)	Wester Hailes	(4.88%)	Southfield	(12.73%)

Access		Involuntary	
Newhaven	(0.00%)	Drylaw	(15.00%)
Southhouse	(0.78%)	Wester Hailes	(15.99%)
Longstone	(1.35%)	The Inch	(17.37%)
Prestonfield	(1.45%)	Granton	(17.92%)
Northfield	(1.78%)	West Pilton	(18.50%)
West Pilton	(2.00%)	West Mains	(20.45%)
West Mains	(2.27%)	Niddrie	(20.89%)

unpopular and one on the median.[21] The relationship here is therefore less clearly defined but it seems that those who move because of ill health stand a better than evens chance of obtaining a popular estate. This was perhaps to be expected considering the strength of medical priorities in allocations to popular estates as seen in Chapter 5.

Social/Environmental problems, being particularly associated with new tenants suggested that the distribution of tenants with these problems would be biased to the unpopular and less popular estates, as first time tenants have a greater chance of being housed there. Three of the seven are unpopular and a further two can be termed intermediate/unpopular while the remaining two estates of West Mains and Gorgie are both popular estates. Again the relationship is not absolutely clear cut but there is a strong bias towards the less popular areas.

Estates in which the residents gave a high proportion of access reasons do not appear to be related to popularity rankings but, as perhaps would be expected, are noticeable for their locations. The estates in the upper quartile of Access reasons, Wester Hailes, Broomhouse, Clermiston, Drylaw, Portobello, Southfield and Saughtonhall are all markedly peripheral in their location and can be grouped into three areas of the city, the West, the North-West and the North-East. All these areas are important peripheral employment areas and if a worker had to travel to these areas from other parts of the city it would be a lengthy

21 Those estates which lie between the median and upper quartile are termed 'intermediate/popular' while those below the median but not in the unpopular category are called 'intermediate/unpopular'.

and time consuming trip. This is not to say that all those who live in these areas also work in them, but because they are peripheral, access is an important factor for those who move there, although it must be borne in mind that access is never of overwhelming importance in the process of mobility.

The most striking, if not unexpected, relationship arose from those areas which have the highest proportions of tenants who moved for Involuntary reasons. Six of the seven top estates are popular areas, viz.: St. Leonards, Central, Prestonfield, Northfield, Leith and Newhaven. The only exception is Gilmerton which is an intermediate/ unpopular estate but is a special case in that it contained 25.6% (1,024) of the Local Authority prefabs which were built in Edinburgh and the majority of tenants (58.22%) from these were rehoused within the area. (Details from Chapter 5, Table 5.2 and Chapter 7, Table 7.2). The other six are among the ten most popular Local Authority estates in Edinburgh and the fact that the points system gives priority to clearance area and closing order victims, clearly works to discriminate in favour of those involved. Not all those entering these popular estates are new tenants from forced rehousing, for indeed it was shown elsewhere that these estates are also likely to be allocated above average numbers of transfer tenants (Chapter 5). However, substantial proportions of the tenants in areas such as St. Leonards, Central, Leith and Newhaven did come from local clearance schemes, as seen

from Chapter 7.

On testing the relationship between the proportion of Involuntary movers and the popularity of the estate a moderate positive correlation of +0.34 was obtained but this was not significant at the 95% level. (Details of the Spearman Rank Correlation are given in Appendix 8.2). The estates in the lower quartiles for all reasons lent support to the relationships suggested above, by being the opposite in popularity terms to those in the upper quartiles. Generally though the association was less strong and because of this the findings will not be discussed in detail.

Summary and Conclusions

In setting up this part of the study and in the construction of the typology of reasons for moving in particular, a great deal of consideration was given to the findings of past studies of mobility. It was accepted that mobility within an urban area arises primarily from a dissatisfaction with the present dwelling and that the causes of this dissatisfaction are the important influences which stimulate the desire to move.

In many previous studies the importance of stage in the life cycle has been discussed and although not all of these support the relevance of this concept, in the present study it appears that changes in space requirements caused by family structure changes are vital in stimulating mobility. These space problems may be due to increased

numbers of children, the lack of sex separation, the taking in of elderly relatives or the problem of too much space when the family has left home. Not only do such reasons appear as vital in stimulating mobility but they also appear to be instrumental in permitting the fulfilment of such desires. Murie noted that "... the family cycle formulation is intended to indicate 'needs'. It does not imply that the housing system distributes resources according to need." (Murie, 1974, p. 114). However, in the present context where the housing 'market' is strictly controlled by institutional constraints, the desire to move can only be realized if it coincides with the need to move as officially recognized, unless an exchange is organized.

Thus what has been examined here is the process of mobility and the reasons for moving which tenants gave within the institutional framework of the Local Authority regulations. It was assumed that these institutional constraints are equal for all applicants (this has been strongly disputed elsewhere; see Gray, 1976) and that all applicants have the same degree of information about the working of the system to enable them to construct their applications in the most favourable manner. Despite the likely inequalities inherent within the system, the fact that all reasons must be genuine, as they are vetted by the housing management, meant that it was felt to be valid to interpret these reasons as true reflections of the causes of movement within the Local Authority housing sector.

Given the importance of problems related to changes in

the life cycle, reasons reflecting space complaints and family structure changes were grouped together to form the first category in the typology under the heading of Family Life Cycle reasons. In the subsequent examination of different groups of movers this category was found to be of major importance in almost all cases. Overall Family Life Cycle reasons accounted for 32.14% of reasons given but for new tenants such reasons were less important than Involuntary and Social/Environmental ones. For transfer tenants, both between and within estates, the Family Life Cycle group of reasons was by far the most important giving a total of 37.76% of all reasons given.

When individual household characteristics were cross-tabulated by the reasons given for moving, Family Life Cycle reasons were given most frequently by those households in life cycle stages 3, 4 and 8, with household heads under the age of 50 years. They were also most often given by households with 7 to 9 members and particularly by female, divorced and widowed household heads. Those households who gave Family Life Cycle reasons tended to move into the less popular housing areas with youthful age structures. On the whole then, the importance of problems associated with Family Life Cycle has been seen to act particularly on those younger household heads with large families and those disrupted households both of which are already housed within the Local Authority sector.

The second category used in the typology was that of Personal/Health reasons. The importance of this type of

reason in creating mobility is rather peculiar to the public housing system. The high numbers of points awarded to medical priorities means that the demand for residential mobility arising from medical complaints is largely one which is satisfied. The main reasons involved here are related to the need for specialized accommodation, particularly on one level or the need to be nearer friends and relations to obtain help.

For all movers this type of reason accounted for 10.35% of the total reasons given but while they were of minor importance to new tenants, they accounted for almost 20% of the reasons given by transfer tenants. As expected, these reasons were given more often by those in the later stages of the life cycle (5,6 and 7) and particularly by retired two-person households with the head over 60 years of age. Such reasons were also important for unemployed household heads and ex-members of the armed forces in stimulating mobility. Those who moved for these reasons had a reasonable chance of obtaining a popular estate.

The third category of Social/Environmental reasons encompasses a wide variety of reasons related to the social and physical environment of householders. This category was designed to gather together reasons as diverse as trouble with the neighbours, the lack of basic facilities in the dwelling and the desire for a change in type of tenancy.

Social/Environmental reasons accounted for 23.68% of all the reasons given for moving but was particularly

relevant for those new tenants who were entering the Local Authority sector for the first time especially from shared accommodation. Related to this was the fact that the majority giving reasons of this nature were in the first three stages of the life cycle or in stage 8, were aged between 20 and 30 years and generally had four or fewer persons in the household. Given these findings, it is hardly surprising that the highest proportions of these householders were found to have been rehoused in the less popular estates.

As predicted by other studies, Access reasons were on the whole of minor importance. The most important reason within this fourth category was that of access to workplace with the location of friends and relatives a much less important aspect. For all movers Access only accounted for 4.60% of the total number of reasons given and was of almost no relevance to the new Local Authority tenants being given ten times more often by transfer tenants. Such reasons were given most frequently by those households in stages 3 and 4 of the life cycle and consequently by those in the middle age groups.

There was little relationship with size of the household or the status of the household head but an important relationship with those in socio-economic groups 5 and 8 (the supervisory groups) was found. Access was also of vital importance to those exchanging homes, accounting for a surprising 20.05% of all the reasons given by this group of movers. With regard to the destinations of such movers,

there was little relationship with estate popularity rankings but a pattern of location in the peripheral employment areas of the city.

The final group of reasons which was investigated was that termed as Involuntary. This category originated from the general lack of investigation into forced moves in the past and was comprised of reasons associated with clearance areas, closing orders, prefab redevelopment, eviction, fire damage and repairs, homelessness, official overcrowding and the giving up of tied accommodation.

The importance of this type of movement in the Local Authority sector was supported by the fact that in the present study some 29.22% of all reasons given were in this Involuntary category. These reasons were especially vital for new tenants and accounted for 36.79% of all the reasons given by this group. However, what is even more striking is the fact that over half of the reasons given by those moving into the Local Authority sector from privately rented accommodation were of this type. Although less important for transfer tenants, Involuntary reasons still accounted for 23.19% of all the reasons and were especially relevant for those moving within estates.

In examining the relationship with household characteristics it was found that those in life cycle stages 5, 6 and 7 were most involved. As new tenants tend to be young then it was surprising to find that these forced movers were more frequently in the older age groups and tended to be one person households. When status was

examined it was found that it was single (never married) household heads who were the most important. The dominance of these single and widowed older household heads was both unexpected and interesting. Involuntary moves were further found to be important for ex-members of the armed forces and personal service workers giving up tied accommodation.

Perhaps the most significant finding in relation to these forced moves apart from the household characteristics noted above, is that fact that the destinations of such movers are some of the most popular Local Authority estates in Edinburgh.

The investigation of the personal reasons for moving, although limited by the role of institutional constraints has proved worthwhile in that it has shown up the differences which exist within the Local Authority housing sector and shown that those factors which influence mobility in other housing sectors also operate here.

Reasons associated with changes in Family Life Cycle have been shown to be of the greatest importance to all groups except those moving into the public housing sector for the first time. These movers rely on Involuntary moves from the private rental sector and Social/Environmental reasons for those from shared accommodation. The importance of Personal/Health reasons and particularly Involuntary reasons has been well illustrated. The former were mainly a source of mobility for transfer tenants while the latter were more often given by new tenants. These new tenants who were largely single or widowed, older households were

found to be in a very privileged position in that their high numbers of points enabled them to gain entry to the most popular estates in the city.

At the beginning of this chapter a brief look at those who moved before 1963 was made. This group essentially describes those who could be termed non-movers in the present study. Although the data for this group are subject to special difficulties it was thought that a brief examination of the characteristics of these non-movers in comparison to more recent movers might help to shed further light on the process of mobility. The following chapter makes these comparisons.

CHAPTER 9

COMPARISONS OF MOVERS AND NON-MOVERS

Introduction

In this chapter an examination of the similarities and differences between those households termed movers and those classed as non-movers will be made. Any individuals or households who changed residence in the period 1st January 1964 to the 30th of June 1974 are classed as movers. Those households and individuals who were in the same residence in 1974 as in 1963 and who had not moved in the interim period are termed non-movers. Of the 5,500 plus cases, 61.6% were found to be movers and 38.4% non-movers.

The nature of the records used as a source of information meant that the data collected for each household were compiled at the time of a change of residence. Consequently, the profiles collected for those termed non-movers consists of information gained at the time of their last move, resulting in much of that information being out of date even at the time of collection. This limits the types of comparisons which can be made between the two groups because of the temporal variations in such things as unemployment rates, incomes, rents and changes in family structure. However, it is a worthwhile and informative exercise to compare the social, economic and demographic facts collected for these two groups in the hope that this may shed some light on the process of mobility and the type of households which move and those which do not.

Those households which are classed as non-movers are only such in terms of the time limits imposed by the study and all non-movers have been movers in the past. Similarly, not all movers would have been termed such had the study been carried out ten years hence for many of those who moved in the last ten years may not move for yet another ten years or indeed may not move ever again. These are the limitations which must be accepted in any study which attempts to take a 'snapshot' examination of a dynamic process such as mobility. Only the availability of full residence histories could overcome this problem.

Previous researchers into intra-urban mobility have done little in the way of investigating those who do not move but it would seem reasonable to treat non-movement as a movement decision and to argue that factors influencing the decision to stay will relate to important factors which result in spatial movement (Murie, 1974). Therefore although the data available to the present study have severe limitations the comparisons which can be made would seem to be worthwhile if they can help to bridge this gap. The basic comparisons made are in terms of family life cycle factors, housing factors and socio-economic aspects. All differences were compared by the chi-square test for two independent samples which permitted testing for data with measurement as weak as the nominal scale. The level of significance was taken as 0.01 in line with the rest of the study and unless otherwise stated all differences were significant at this level.

Comparisons:

Stage in the Life Cycle

With the importance of stage in the life cycle as a determinant of mobility, this factor was chosen for the first comparisons between movers and non-movers (Table 9.1). Life cycle stage 3 (young couples with young children) accounts for the greatest percentage of total households in both groups. The non-mover group has some 42% of all households in this life cycle stage while movers have a slightly lower proportion at 30%. The overall dominance of this life cycle group reflects the strong bias in Local Authority housing, particularly in the past, in providing homes for young families which in turn has been reflected in the composition of their housing stock by a predominance of three and four apartment homes. The higher percentage of this life cycle stage in the non-mover group may reflect a historical rather than a real difference in that the more recent mover group contains higher percentages of single and elderly households illustrating a change of policy in the late 1960s and early 1970s.

The most important difference between the two groups (as indicated by the χ^2 test) arises from the numbers of households in Stage 4 (young couples with older children). This group forms 18% of the non-movers but under 10% of the movers. This would seem to suggest that those households which move to new homes when their children have grown, are more likely to remain there on a permanent basis. This was suggested by Foote (1960) as being a typical pattern for

Table 9.1 Movers and Non-Movers by Life Cycle Stage

Life Cycle Stage	Movers		Non-Movers	
	No.	%	No.	%
1. Young single household head, no children	76	2.57	5	0.27
2. Young couple, no children	251	8.17	128	6.87
3. Young couple, young children	939	30.58	795	42.69
4. Young couple, older children	307	9.99	349	18.74
5. Older couple, older children	211	6.87	177	9.50
6. Older couple, no children	432	14.07	166	8.92
7. Older single head, no children	548	17.84	173	9.29
8. Single head with children	298	9.70	66	3.54
9. All others	9	0.29	3	0.16

American owner occupiers and would seem also to be reasonable in this context. Households are less likely to move to adjust for too much space when the family has left home than they are to move because of overcrowding.

The other outstanding differences to be seen are the smaller proportions of non-movers than movers in life cycle stages 6 and 7 (older couples with older children and older single household heads). This is probably a reflection of the differences in past and present policies. The higher numbers of involuntary movers for clearance in the movers group is likely to be the main cause of the variation here, for as was seen in Chapter 8, households in these life cycle stages were particularly vulnerable in terms of being forced to move. The much higher levels of movers in life cycle stage 8 (single head with children) probably reflects both the disturbing effect of family break up resulting in mobility and the higher divorce and separation rates in more recent years.

Over all then stayers would seem to be those households who form stable family groups (stages 3, 4 and 5) but particularly those in stage 4 who move prior to the children leaving home. Movers on the other hand are much more likely to be young single household heads, older couples with no children, older single household heads with no children or one parent families.

Age of Household Head

As discussed previously, age of household head is

probably the single most important factor in determining whether a household will move or not. In an examination of this factor, age was grouped into five,ten year classes (Table 9.2), with a sixth category of over 65 years. The greatest difference between the two groups is found in the 15 to 24.9 years age group where there is proportionately six times as many movers as non-movers. All other age groups are fairly comparable with the exception of those aged 35 to 44.9 years where there are 10% more non-movers than movers. This supports the findings for family life cycle in that household heads in this age group would tend to be found in life cycle stages 3 and 4. The slight increase in the proportion of movers over 55 years also accords with these findings.

The figures are less strongly indicative of decreased mobility with age than might have been expected for example Murie (1974) found that 29% of non-mover household heads were under 44 years while 63% of movers were found in these age groups. In looking at the comparable figures in the present study, approximately 60% of movers were found to be under 44 years which is roughly equivalent but some 59% of non-movers are also under this age. This would seem to indicate an anomaly in the present study, but if it is considered that those termed non-movers here are all households who have not moved in the ten years 1963-1973, then the distribution of non-movers by age could be adjusted by a minimum of ten years to allow a direct comparison between movers and non-movers in terms of present age of household head. This results in 31% of non-movers falling

Table 9.2 Movers and Non-Movers by Age of Household Head

Age in Years	Movers		Non-Movers	
	No.	%	No.	%
15-24.9	576	16.80	57	2.78
25-34.9	899	26.23	592	28.89
35-44.9	609	17.76	560	27.33
45-54.9	491	14.32	361	17.62
55-64.9	454	13.24	267	13.03
65 and over	399	11.64	212	10.35

Table 9.3 Movers and Non-Movers by Age of Dependants

Age in Years	Movers		Non-Movers	
	No.	%	No.	%
0. -4.9	1268	40.25	752	35.37
5 -9.9	1040	33.02	725	34.10
10-14.9	842	26.73	649	30.53

into the under 44 years category which would seem to be much more acceptable. When the difference between movers and non-movers was then tested the results gave a much stronger association of non-movers with increased age. This adjusted comparison gives a firm indication that the probability of being a mover decreases with increased age as would have been expected from the many other studies discussed in Chapters 2 and 8.

Age of Children

Age of household head is not alone in determining mobility for the other component of life cycle stage, that of age of children, must also be taken into account in its own right. Age of children has been found to be an important indicator for movers and non-movers. It has frequently been argued that children of school age represent a set of ties to a particular area and that families with children of this age are less residentially mobile than those without. Long (1972) studied this idea and found that with age of household head held constant, families with children of under 6 years only had higher rates of movement than those with children of 6 to 17 years only. There was a great deal of variation among family heads of different ages but at the same stage of the life cycle. In the present study the major differences occurred in the youngest and oldest age groups (Table 9.3). The findings here would seem to support to some degree the idea that families with younger children are more mobile, although it is not possible to hold constant

age of household heads. Over 40% of movers' children were below the age of 5 years compared with 35% for non-movers while only 26% of movers' children were aged between 10 and 14.9 years compared with 30% of non-movers. This is of course strongly linked with the predominantly younger age of household head in the mover group. When it is remembered that ages of children could be adjusted in a similar way to those of household heads, then non-movers' families will be much older than those of movers, although this would make no allowance for additional children born into non-mover families during the stay in their present homes.

Number of Persons in the Household

It has been suggested elsewhere that households with larger families will have a greater tendency to move (Rossi, 1955). However the number of children in a family has been found to be of less importance than whether there were any or none. The incremental effect of additional children on mobility was found to be less than the effect associated with going from zero to one child. In the present study those households who had not moved in the ten year period 1963-1973 had larger families than recent movers (Table 9.4). The tendency for these larger families not to move so frequently may well be explained by the distribution of opportunities to move within the local authority sector. Non-movers will be seen to have in general larger houses than movers and if the distribution of council housing by size is examined (Chapter 5) it is evident that there are

only a limited number of dwellings with 4 or 5 apartments. This restricts the opportunities for moving by larger families, while the preponderance of 3 apartment and smaller houses provides an ample set of opportunities for moving with a smaller sized family. These findings contradict those of Murie (1974) and Cullingworth (1968) who both found that movers had larger families than non-movers, but neither of these studies were dealing specifically with the local authority housing sector.

The data used here are again constrained to a large degree by the outdated nature of the records for non-movers which do not account for changing family size over a period of time. It is possible however to make a comparison of family size for 1963-1973 and for the period before 1963 (Table 9.4). There appears to be a definite trend towards smaller families in the more recent time period with families with more than two dependants being proportionately fewer. It is interesting to note that families with one child and those with none are the most likely to be mobile. This tends to refute the idea that the first child has an important constraining influence on mobility while it is well known that those families with no children will be the most mobile (Long, 1972).

Some families have dependants other than their children living with them, such as grandchildren, brothers and sisters and many have elderly or infirm parents also sharing their homes. These other dependents are very much in the minority, and for both movers and non-movers over 95% of their

Table 9.4 Movers and Non-Movers by Number of Persons in the Household

Number in Household	Movers		Non-Movers	
	No.	%	No.	%
1	500	14.52	350	16.31
2	825	23.96	366	17.05
3	819	23.79	448	20.88
4	603	17.51	446	20.78
5	345	10.02	259	12.07
6+	347	10.08	277	12.92

Table 9.5 Civil Status of Movers and Non-Movers

Status	Movers		Non-Movers	
	No.	%	No.	%
Married	2440	70.87	1408	65.61
Single	281	8.16	143	6.66
Widowed	378	10.98	473	22.04
Divorced	343	9.96	119	5.55

dependants were their own children. Parents account for around 1% in both groups and there are no significant differences between the two groups in terms of the type of dependants living with them.

Civil Status of Household Heads

Movers and non movers were compared on the basis of their civil status i.e. whether married, single, divorced or widowed (Table 9.5). There is little difference between movers and non-movers in terms of the proportions of married and single householders. A slightly higher percentage of movers than non-movers are single or married but the difference is not great. The largest contribution to the significant difference between movers and non-movers undoubtedly arises from the difference in numbers of widowed household heads between the two groups. Only 10.98% of movers are widowed while 22.04% of non-movers are classed as such. This is as could be expected for widowhood is strongly related to age and this has already been shown to be important in indicating mobility.

The differentials arising between movers and non-movers where divorced household heads are concerned is the opposite to that of widowed householders. Some 74.24% of divorced household heads are movers while only 25.76% are non-movers. Divorced householders would then seem to be three times as likely to move as to remain in the same house. This was also as expected, for as the husband is normally the householder and therefore the legal tenant, unless he is

evicted by the Council for rent arrears or other misdemeanours, he has the right to remain as a tenant. If the tenancy is not transferred freely to the wife she must move to obtain a separation. Further, as the wife frequently has the custody of any children of the marriage and may be officially made homeless by any move, she will probably have a high priority for rehousing by the council. In every case one spouse at least must move and either a transfer of tenancy or a new tenancy will result from the majority of cases.

Sex of Household Head

The sex of the head of the household was recorded for before and after a move was accomplished (Table 9.6). In both cases in the mover group, around 74% of household heads were male and about 25% were female. However in looking at the non-movers before a move or transfer of tenancy, 87.79% were male and only 12.21% were female while after the move (move into present house) only 67.24% were male and 32.76% were female household heads. This can be explained by the strong relationship between widowhood and non-movers and the predominant pattern of widows rather than widowers in this country. These findings agreed with Murie's (1974) who noted a higher proportion of female household heads in his non-mover than mover group.

Size of Past and Present House

In examining the house sizes of movers and non-movers a

significant difference was noted. In previous houses the main contribution to the difference came from the fact that a much higher percentage of movers lived in one apartment dwellings and fewer in two and three apartments than non-movers (Table 9.7). For dwellings over this size there was little difference. In present house sizes a similar pattern emerges with 20.48% of movers living in one and two apartment houses compared with only 12.72% of non-movers. However, there are fewer movers than expected living in three and four apartment dwellings with 76.06% compared with 83.92% of non-movers in these sized homes. In larger houses the distribution of the two groups is very similar. To generalize then, those households who were movers during the study period tended to live in smaller homes both before and after moving.

A comparison was made for both groups of the size of house before and after moving (Table 9.7). From this it can be seen that in general, tenants who move increase their house size. This is as might be expected for people moving from non-council to council housing for the latter type is predominantly three apartment and larger. As many households move because of increased family size (Chapter 8) it is hardly surprising that the predominant movement is to larger homes. There would seem to be less movement to smaller homes with decreased family size.

In examining the size change for non-movers, when they last moved, exactly the same pattern is found. This merely extends the study back ten years and shows the long term

Table 9.6 Sex of Household Head for Movers and Non-Movers

Before Moving	Movers		Non-Movers	
	No.	%	No.	%
Male	2576	74.85	1884	87.79
Female	866	25.15	262	12.21
After Moving				
Male	2559	74.32	1443	67.24
Female	884	25.68	703	32.76

(includes transfers of tenancy)

Table 9.7 Number of Apartment in Present and Previous House for Movers and Non-Movers

No. Apartments	Movers		Non-Movers	
	No.	%	No.	%
Present house				
1	73	2.12	20	0.93
2	632	18.36	253	11.79
3	1859	53.99	1307	60.90
4	760	22.07	494	23.02
5+	119	3.45	72	3.35
Previous house				
1	1171	34.25	483	24.27
2	846	24.75	567	28.49
3	984	28.78	708	35.57
4	367	10.73	208	10.45
5+	50	1.46	24	1.21

importance of moving to obtain a larger home.

Type of Tenancy Previously Held

In comparing the previous tenure of movers and non-movers five categories were examined viz. 1) council, 2) owner occupied, 3) private rental, 4) shared and 5) tied. Three of the five categories account for the difference between movers and non movers, these being council, owner occupied and private rental. Over 35% of movers were previous council tenants while only 25% of non-movers were such. The higher amount of movement between council dwellings in the more recent time period could have been expected because of a loosening up of the supply of local authority housing in the country as a whole in the 1960s. In Edinburgh in particular there seems to have been a substantial increase in the supply of new housing in this period. Over 35% of the total council housing stock in the city to date has been built since 1963. This has undoubtedly made it easier to obtain a transfer between dwellings than it was in the past.

It was also found that many more movers had held a previous tenancy as owner occupiers than those moving prior to 1963, 6.13% compared to 2.56%. This is also as might have been expected for it is only in the last decade that owner occupiers have had any real chance of obtaining a council tenancy. Relaxation in the local authority attitude to rehousing owner occupiers has developed because of two basic factors. Firstly, as mentioned above, towards

the end of the 1960s and in the early 1970s the public sector was relatively well endowed with new properties and the pressure on the waiting list was not so great. Secondly, the large increase in clearance and closing orders in the 1960s meant that those owner occupiers in sub-standard properties were much more likely to be rehoused as part of the council's policy.

The largest contribution to the difference between movers and non-movers however arises from the category of private rental. Only 34.48% of movers came from private rental into the local authority sector campared with 50.77% of the non-mover group. This is despite the large increase in clearance schemes and must be a reflection of the substantial contraction of the private rental sector in most cities over the past decade.

The other two groups of tied and shared tenancies both have more movers than non-movers (Table 9.8) but the differences here are not as substantial as those in the other categories.

Type of Move

This is related to type of previous tenancy but here moves were classified into four groups based on administrative characteristics viz. 1) exchanges, 2) filtration, 3) rehousing and 4) transfers.

1) Exchanges are where the move is arranged entirely by the tenants and is only vetted by the council. This is mainly between two council houses but may take place between

a council tenant and an owner occupier in the city or between a council tenant and a tenant in another local authority or even an owner occupier elsewhere in Scotland or the rest of the United Kingdom. Exchanges are of minor importance and account for only 8.08% of all moves (movers and non-movers together.

2) Filtration also forms a very minor part of the total moves completed, accounting for only 1.12% in all. This type of move is made when an owner occupier becomes eligible for a council house on condition that he will accept as a tenant in his property an applicant from the local authority waiting list. This is the exception rather than the rule when dealing with owner occupiers. If a tenant is rehoused from private rental under this scheme, the condition is then made that the Housing Department nominates the succeeding tenant in his place subject to the factor's permission.

3) Rehousing is the term used here to denote the fact that an applicant is being rehoused from any other type of tenancy apart from council. This category is predominantly made up of new council tenants and includes households moving into the council sector from private rental, owner-occupation, tied accommodation and shared dwellings. This category accounts for 69.11% of all moves.

4) Transfers are moves made only between council houses and excludes mutual exchanges. Transfers make up 21.68% of all moves made (Table 9.9.).

The two categories which contribute most to the

Table 9.8 Tenure of Previous Dwelling for Movers and Non-Movers

Tenure	Movers		Non-Movers	
	No.	%	No.	%
Council	1212	35.20	349	23.56
Owner occupier	211	6.13	38	2.56
Private rental	1187	34.48	752	50.77
Shared	720	20.91	244	16.47
Tied	106	3.08	24	1.62
Unknown	7	0.20	74	4.99

Table 9.9 Type of Move for Movers and Non-Movers (last move made)

Type of Move	Movers		Non-Movers		All
	No.	%	No.	%	%
Exchange	272	7.91	126	8.49	8.08
Filtration	34	0.98	21	1.42	1.12
Rehousing	2275	66.19	1126	75.87	69.11
Transfer	856	24.91	211	14.22	21.68

Table 9.10 Non-Economically Active Household Heads, Movers and Non-Movers

Category	Movers		Non-Movers	
	No.	%	No.	%
Unemployed	197	26.02	30	6.39
Retired	345	45.57	217	46.27
Housewives	215	28.40	222	47.33

differential are those of rehousing and transfers. In the mover group 66.19% are rehousing moves while while 75.87% of non-movers made this type of move into their present house. This is in line with the fact that there are fewer new, first time council tenants who are movers than non-movers. The corollary of this is that more movers than non-movers have made transfers, 24.91% and 14.22% respectively. Again this is probably related to the loosening up of the council housing supply after 1963.

Rent

Due to the nature of the data it was impossible to carry out any tests which would have given meaningful results in this case. The large time lag involved in some of the data and the inflationary situation over the past number of years has meant that rentals paid ten years or more ago are not directly comparable to present day payments. However, a comparison of rents paid before and after moving can be made separately for the two groups. In both instances it was found that after a move there were fewer tenants paying very low rents but there were also fewer paying very high rents while there was an increase in the numbers paying a moderate rental. This undoubtedly arises from the degree of control which is maintained over council rents by government policies.

Socio-Economic Status of Household Head

In an examination of the socio-economic status of

household heads in relation to movers and non-movers the difference was not found to be significant at the 0.01 level. This would seem to indicate that the idea of social differences influencing mobility is limited in the present context. The predominantly uniform socio-economic status of council tenants has resulted in little differentiation in these terms throughout this study. Approximately 43% of all the council tenants are in the 'skilled manual workers' groups while over 21% are classed as 'unskilled manual workers' therefore it is hardly surprising that socio-economic status is not an important differentiating variable.

Non-Economically Active Household Heads

Not all household heads could be classed in terms of their socio-economic status as not all were employed at the time of study. Three classes were created to deal with this problem viz. 1) unemployed, 2) retired, and 3)housewife. Proportionately there were six and a half times as many unemployed movers as unemployed non-movers. This may be accounted for by an increase in the general level of unemployment over the two periods considered but it is also likely that unemployment is a disruptive force in the household and may cause problems of rent arrears with subsequent evictions, or a move to alternative accommodation which is more within the tenant's means. There was little evidence here or elsewhere (Chapter 8) to suggest that movement occurs because of problems of access to new

employment.

The numbers of retired household heads were very similar for the two groups with slightly fewer movers being retired than non-movers. The difference however is not a substantial one.

Only 28.40% of non-economically active movers were classed as housewives compared to 47.33% of non-movers. This accords well with the fact that there were more female household heads who were non-movers and that more non-movers were widowed. Many of those household heads who were classed as housewives would be widows and senior citizens.

Income

The data here suffers from the same restrictions as rentals. No direct comparisons between the incomes of the two groups can be made as this would do no more than show that incomes in general had risen over the two time periods. This information then, although potentially useful, cannot be used in the comparison of the characteristics of movers and non-movers.

Duration of Residence

By definition in this study non-movers have lived longer in the same house than movers. It would therefore have been pointless to examine length of residence in present house but it was felt that it might be worth while to look at the length of residence in previous dwellings.

This was examined in one year periods up to ten years and then in three five year classes thereafter (Table 9.11). There was a clear pattern of more movers than non-movers for length of residence of up to three years but for any longer more non-movers than movers was the rule, particularly when residence durations of over ten years were examined (Table 9.11). Thus it seems evident that those households who moved before 1963 tended to remain longer in the same dwelling than those who have moved since then. It may be that this was related to the above mentioned loosening of the housing market in recent years which has resulted in waiting times for council housing being reduced. There would now seem to be less need for remain in another house for a long time period while waiting for a local authority dwelling. However it is doubtful whether this could explain all the variation between the two groups and it may well be that there is a lengthening of stay in any dwelling before one becomes a non-mover although it is generally accepted that the longer the residence in a dwelling the less likely the household is to move at all. The present data however could neither support nor refute this idea.

Summary

In this chapter the differences between those termed movers and those classed as non-movers have been examined. Undoubtedly those influences associated with family life cycle changes have been shown to be the most important in

Table 9.11 Duration of Residence in Previous Dwelling for Movers and Non-Movers

Length of Stay in Years	Movers		Non-Movers	
	No.	%	No.	%
under 1 year	479	13.63	63	4.11
1	530	15.08	112	7.31
2	383	10.89	93	6.06
3	272	7.74	126	8.21
4	202	5.75	127	8.28
5	169	4.81	112	7.30
6	143	4.07	117	7.63
7	115	3.27	89	5.81
8	94	2.67	71	4.63
9	121	3.44	51	3.32
10	103	2.93	63	4.11
11-14.9	312	8.87	252	16.43
15-19.9	243	6.91	118	7.69
20+	349	9.93	140	9.13

distinguishing between movers and non-movers. Stage in the life cycle, age of household head and the ages of children were shown to be crucial with younger householders and those with younger children being more mobile. Stable family groups, particularly those with older children are less likely to be mobile than single household heads or disrupted family groups irrespective of age. Smaller families appeared to have more opportunities for movement in the public sector than larger ones who were limited by the availability of larger dwellings.

The influence of the residential environment was also of importance as it related to movers and non-movers. Movers consistently tended to live in smaller houses than non-movers, probably related to their smaller family size, and were more likely to have previously lived in a council or an owner occupied house than non-movers. These differences however may have been more of a reflection of changing family patterns and housing policy over time than any true variation between movers and non-movers.

Differentiation in terms of socio-economic factors was of little importance due to the relatively uniform type of population being studied and the invalidation of economic data for comparative purposes through time.

Many of the differences found lend support to previous ideas such as younger household heads being more mobile while other aspects such as age and size of family and duration of residence were confirmed as influences on mobility. Undoubtedly this is an area where much more

research could be done particularly into the problem of those non-movers who are in reality frustrated movers. Many households have their mobility intentions thwarted by the workings of the system and institutional constraints. It would be an important extension of this chapter to assess the types of households involved in this problem and to try to find in what ways the housing system fails to allow for mobility by those households. This aspect and other topics suggested by the present study as being worthy of future research are put forward in the next chapter as an integral part of the summary.

CHAPTER 10

SUMMARY AND CONCLUSIONS

In concluding this study it would seem appropriate to recall its initial aims and to assess to what degree these have been accomplished. The study set out to provide information about the patterns and processes of mobility as found in the local authority housing sector of a Scottish city by posing three types of questions, namely;

1) what are the patterns of flow and the direction of movement,

2) who moves, and

3) why do they move?

In the subsequent examination of mobility as related to the public housing sector in Edinburgh it proved feasible to answer all of these queries to a satisfactory degree. However, it was less feasible to keep the answers distinct from one another, for as Johnston (1971) noted "... since the same spatial pattern of migration could be produced by a number of processes it is not possible to observe a pattern and infer back to its cause. Study of the spatial pattern of moves should parallel that of the process." (Johnston, 1971, p. 295). Consequently it seemed impracticable to structure the study into two separate parts but more rewarding to allow the two threads of pattern and process to run together through the thesis.

Within this flexible structure these aspects were investigated on three levels. Firstly, the movement of new

tenants into the local authority housing sector was examined. To carry out this part of the analysis a description of the social structure of Edinburgh was required to define which types of areas act as sources for the public sector. Although the public housing sector tends to be relatively isolated from the rest of the housing system it is here with the intake of new tenants that the most important interface is found.

A brief examination of the classic models of urban structure confirmed their inadequacy in dealing with modern complex urban areas. In British cities in particular the added peculiarity of the large local authority housing sector increases their inapplicability and means that the procedure of factor analysis provides the only realistic solution to a description of social structure. A principal components analysis (a special case of factor analysis) was therefore carried out for Edinburgh using thirty five variables from the 1971 census. The resulting components were reasonably comparable to those found in other British studies and could be described as two socio-economic status components, two life cycle/demographic components, one housing/tenure component and one isolating mobility within the city. The areal distribution of their component scores produced the basis for a typology of social areas within the city which was used in an ecological analysis of the movement of new tenants in social space.

In the present study however, the uniformity of origins and destinations in these social/demographic terms

limited the usefulness and validity of this type of analysis. Both origins and destinations were almost entirely areas of low social status and while origins tended to have a mixed or medium demographic structure, destinations were predominantly youthful in this respect. Despite these seemingly uninformative results, this analysis did provide a degree of insight into the allocation of new tenants to housing in the public sector. Not all new tenants are young, neither are all local authority estates demographically youthful, but over half of all new tenants went to these 'young' areas. When it is realized that those are the local authority estates which are generally among the least popular in the city, then something of the bias which exists in the allocation system can be gauged. This point was further emphasized when new tenants were subdivided by previous tenure and the nature of these two groups and their origins and destinations were compared. Those who came from shared accommodation (principally parental dwellings) were generally younger than those from private rental and were more likely to be housed in these young and unpopular areas. New tenants from other tenures were older and were more likely to move into demographically older local authority areas, although around half of this group was also allocated to the less popular areas. These differences were later seen to arise from the higher proportion of forced movers from private rental and other tenures and their consequently advantageous position in the allocation system.

The spatial pattern of moves for these new tenants was assessed in terms of distance, directional and sectoral biases. In terms of the distances moved, those from shared accommodation exhibited the expected distance decay pattern with the majority of their moves being over short distances. Those from private rental accommodation showed a predominance of medium to long distance moves related to the relative spatial location of the two housing sectors in the city. Directional bias for both groups indicated a movement away from the north-east of Edinburgh and a gravitation to the West and the South-east in particular. When related to housing opportunities within the city it was found that this movement, together with the distances moved by those from private rental, could best be explained by the influence of the structural characteristics of housing supply within the city, rather than by any behavioural aspects such as preference. Sectoral biases as related to the C.B.D. and workplace were found to be of little influence in the movement patterns displayed by new tenants which is contrary to findings elsewhere in relation to owner occupied housing. It is likely that the institutional constraints imposed through the allocations policy outweigh any preference to remain within a home sector of the city.

The second area of investigation was into movement within the local authority sector at a between estate level. The first consideration here was to look at the background of council housing in general and the estates in Edinburgh in particular. From this it was evident that as the Morris

Committee stated, "To a considerable extent the problems manifested in particular types of council housing scheme derive from the period in which they were built and, more significantly, from the purpose for which they were built." (H.M.S.O., 1975, p. 67). The 'general needs' schemes of the 1920s in Edinburgh, as elsewhere in Scotland, have tended to be the most successful and are highly popular despite their age, associated wear and tear and their limited facilities. Many are now being improved.

Much of the housing built under the slum clearance acts of 1930 and 1935, in contrast, now constitutes some of the most deprived areas of Scottish cities. These predominantly high density estates were purpose built to replace the worst inner city areas and in many ways they replaced them literally, with high density housing of low amenity being filled by large numbers of low status, low income tenants. Many of these estates with their poor reputations never overcame that original stigma and have steadily deteriorated, while their problems of deprivation have become largely self-perpetuating. Their poor reputations have become significant over and above their actual social and physical conditions. Consequently, these areas have become difficult to let and those who accept places there are often those with the least range of choices. Frequently this leads to an increase in child densities, often in areas of tenements which are least suited to cope. In turn, increased vandalism and accusations of 'dumping' result. The feeling that an estate is becoming a 'dumping ground'

stimulates a desire to transfer out and it then becomes impossible to develop a stable community. So the process continues, spiralling downwards until estates become blitzed and semi-derelict with a self-perpetuating deprivation which it would appear is almost impossible to halt outside of drastic steps such as complete demolition. In Edinburgh such areas are typified by the estates of Craigmillar and Niddrie.

Post-war housing conditions, although seldom reaching such appalling depths, have also suffered from similar vicious cycles of decay and deprivation. In Edinburgh the relatively restricted size of the post-war local authority estates has to some extent alleviated their problems. However, those areas built in the late 1950s and early 1960s when the 'general needs' category was again abandoned for slum clearance, probably form some of the worst housing ever built, even worse than the 1930s areas in levels of amenity (Byrne, 1976). In Edinburgh the high density flats built in areas such as Muirhouse can be realistically compared with areas of 1930s housing and now have more than their share of boarded and bricked up housing, including multi-storey flats, for example Martello Tower which has been totally vacated and is now up for sale by the local authority for private development.

With these differences in housing background in mind, a grouping of estates into similar categories was attempted. The first grouping into inter-war and post-war estates showed up a difference in population age structure and one

of socio-economic status. The population in post-war estates was predominantly younger and of a higher socio-economic status than that in inter-war areas. This division was not altogether satisfactory as it combined the two diverse kinds of inter-war estates.

As a components analysis had shown that demographic structure was the principal differentiating criterion between local authority estates in the city, a division between demographically young and old estates was made but this did little more than support the first division into inter-war and post-war. Other studies (H.M.S.O., 1976; Herbert, 1972) had shown that social reputation was one of the important discriminating variables used by local authority tenants in listing their preferences, therefore some surrogate for this was sought. As the level of points required for entry into an estate determines the length of queues for areas then it was felt that points levels could be used fairly successfully to group estates in terms of their popularity.

Popular estates were found to have higher than average proportions of cottage type dwellings and a lower proportion of flats, especially multi-storeys. They were built predominantly in the inter-war period and over half of the most popular had their housing built under the early 'general needs' acts. Small, central, post-war estates were also popular. In population terms these popular estates were characterized by having a shortage of young household heads and few new tenants, particularly those from shared

accommodation. The ability to wait was seen to be crucial in determining the social and demographic composition of estates. As applicants for local authority homes exercise their choice in a quasi-market situation where the price they pay is waiting time (English, 1976), then this effectively sifts tenants in a way which is highly dependent on their existing housing situations.

Young couples from shared accommodation who were relatively desperate for rehousing but who were unable to accumulate extra points from either medical or clearance priorities were effectively denied entry into the most desirable areas. Transfer tenants however, who were relatively well housed and who could afford to wait were able to accumulate points levels necessary for entry into these areas. Other groups who were in favourable positions with regard to rehousing in the most popular areas were those from private rental or other tenancies and those in older local authority housing who were being forced to move.

Given this wide variety of local authority estates in Edinburgh it was interesting to trace the patterns of movement between them. By taking transfer tenants alone, some of the inequality in the allocations system was extracted, for transfer tenants on the whole tended to be a relatively privileged group. When estates which were gaining and losing by transfers were examined and this was related to their popularity status there was not an exact relationship. Although the general pattern was for popular

areas to gain and unpopular areas to lose, only 54% of all transfers went to destinations more popular than their origin while 45% went to less popular areas. This was probably related to the relatively small size of the most popular estates.

The actual spatial pattern of transfers in the city was analysed by principal components in an attempt to distinguish the main underlying groupings. From an initial position where groups of estates could be vaguely seen to interact, it was possible to distinguish ten sub-systems in the city. These were remarkably self-contained in terms of their transfer interactions. As these components distinguished estates which were areally associated, the role of distance was thought to be of importance. Testing this by a multiple regression analysis, some 40% of the total variation in transfer interactions between estates could be explained by distance while a further 10% was explained by estate size.

A Markov Chain analysis was used to illustrate both 'migrant distance' between estates and the resultant distribution of tenants, were the present patterns to persist through time. An interesting comparison was possible with a similar analysis using free choice data. This tended to even out the 'migrant distances' between estates and when the future distribution of population was examined, the pattern was one of marked increases in holdings by the popular estates and decreases in the unpopular ones. This further emphasized the degree of disparity between the present

allocation policy and the desires of tenants. These projected population distributions were purely hypothetical, however, for estates obviously could not accommodate four times the number of tenants for which they were designed. Neither could the strength of demand for the more popular estates truly alter the pattern of flow, for it is the availability of vacancies at any point in time which determines the level and pattern of intra-urban mobility. On the other hand the low level of demand for unpopular areas may mean that movement to these areas falls below the potential which is suggested by vacancy levels, resulting in large areas of unusable housing such as found in Niddrie Mains Terrace. The qualitative nature of the intra-urban flows is determined by the institutional constraints and the allocations policy of the local authority. The excess demand illustrated here for certain kinds of estates can best be used to guide the conception of new housing areas where the preferences of tenants could be realized.

Not all tenants move between estates, many move within areas and this was the third level of movement which was investigated. It has been recognized elsewhere, that many of the applicants for problem estates tend to live there already and that in this way, the deprived population on these estates is directly self-perpetuating (English, 1976). Here it is evident that a similar process takes place in many of the estates in Edinburgh. When the proportion of tenants who came from shared accommodation within the estate was

calculated, the relatively unpopular estates of West Pilton, Niddrie, Southfield (including Bingham), Craigmillar and Muirhouse were those with the highest levels of such movers.

When transfers between estates were examined Gilmerton, Craigmillar and Niddrie had half of all their transfer tenants moving within the estate. Gilmerton was rather a special case with a large programme of prefab redevelopment occurring during the study period. However the considerable demand for movement within the other less popular estates can probably be seen as an attempt by households to improve their situation in a realistic way, given the shortage of housing in the more attractive areas (H.M.S.O., 1976).

Comparisons were made between new tenants moving within the estate and transfer tenants who were moving at both a within and a between estate level. Within estate transfer tenants tended to be older than those who moved between estates and this was thought to reflect the desire of these older tenants to remain in familiar areas. Tenants who moved within estates tended to do so because of Family Life Cycle or Involuntary reasons while those who moved between areas were more likely to have problems related to access.

The spatial pattern of the moves within estates was examined in detail for four areas and seemed to suggest a movement towards the more popular and newer areas within them. Some 80% of movers maintained or improved their housing position in terms of points levels by these moves. How far these within estate moves reflected a real choice by tenants

was assessed by examining the realization of choices for all applicants who moved at this level. This was surprisingly high, with 84% achieving rehousing in an area of their choice. Transfer tenants were, however, more likely to be frustrated inter-estate movers than new tenants. Although it is necessary to be wary when defining preferences in terms of these stated choices, undoubtedly these were realistic choices as far as rehousing positions were concerned. The relative improvements in external environments which could be achieved by such short distance moves were illustrated photographically in this section.

Up to Chapter 8 in the thesis, the motivations behind moves were discussed only indirectly or briefly in relation to specific groups. In Chapter 8 the reasons given for movement on all levels were discussed in detail, as they provided an important key to the process of mobility. Five groups of reasons were formulated by taking into consideration previous literature on the mobility process, together with peculiarities of the local authority housing sector. These categories were Family Life Cycle, Personal/ Health, Social/Environmental, Access and Involuntary.

In general terms the problems associated with life cycle changes, as reflected by the intervening variable of dissatisfaction with present dwelling, are of major importance in stimulating the desire to move at an intra-urban level. Overall this importance was supported here, with Family Life Cycle reasons accounting for approximately one third of the reasons given. However, for new tenants such reasons were

less important than Involuntary reasons for those from private rental and Social/Environmental reasons for those from shared accommodation. Family Life Cycle reasons did however form the major group of reasons for moving within the local authority sector at both the between and within estate levels. In a more detailed breakdown it was interesting to find that the types of households which gave such reasons for moving were those with fairly young household heads, those with large families, for which space reasons loomed large, or disrupted households of all ages and sizes.

Over 10% of all movers gave reasons in the second category. Again Personal/Health reasons were of minor importance to new tenants but accounted for a fifth of all the reasons given by transfer tenants, particularly those in the later stages of the life cycle, with household heads over sixty years of age, or those who were unemployed. For new tenants this type of reason was important for those who were ex-members of the armed forces.

The third category of Social/Environmental reasons was an amalgam of many different aspects. However, it was predominantly made up of those factors which exert social or physical environmental influences on households, for example problems encountered by young couples living with parents, overcrowding or the lack of basic facilities. This group was important for those new tenants from shared accommodation and consequently was given by young, small households in the early stages of the life cycle or

disrupted households.

The fourth category which grouped reasons associated with access was expected to be of minor importance in stimulating movement within the urban area and this was substantiated for movement related to the local authority sector. Access accounted for only around 4% of all the reasons given and was particularly unimportant for new tenants. Some relationship was found between those in socio-economic groups 5 and 8 (supervisory groups) but the clearest relationship was with those who were moving within the local authority sector by exchange. Access was given as a reason for 20% of all the moves made by this group. This must be seen as an indictment of the lack of consideration given to this problem by the transfer policy, when the low level of such a motivation in general is realized.

Finally, Involuntary moves were examined. The importance of forced moves has been implied in several studies particularly with regard to local authority housing. This group of reasons was second in importance to Family Life Cycle reasons and accounted for almost 30% of all the reasons given. However, it was in relation to new tenants that it was particularly important accounting for 36% of the reasons given by this group as a whole and for over half of the reasons given by those from private rental, owner occupation and tied accommodation. For transfer tenants those moving within estates were most involved in forced movement. Generally it was those older households, mainly of one person,

in life cycle stages 5, 6 and 7 who were the most vulnerable to forced moves.

A particularly interesting feature of this part of the analysis was in relation to the destination of households giving particular types of reasons for moving. While there was no immediately recognized reason why those households moving for different purposes should be allocated to different types of estates, the fact that allocations were by points and that these were awarded by assessed need of the household, then it was obvious that households with different needs (and consequently different points levels) would have differential access to estates. Those households moving for Family Life Cycle reasons tended to be rehoused in the less popular housing areas with youthful demographic structures (low points). Households who gave Personal/ Health reasons on the other hand had high priorities and consequently had a reasonable chance of obtaining housing in a popular estate.

The third group of movers who gave Social/Environmental reasons were in a similar category to those moving for Family Life Cycle reasons and therefore tended to be rehoused in the less popular areas. Those moving for Access reasons had no firm pattern of allocation by type of estate and as many of these movers were exchangers, no points levels were involved.

The final category of forced movers with their associated high priorities for rehousing were particularly likely to obtain rehousing in the more popular estates. The differential demand for estates (reflected in the level of

points required for entry) combines with the different priorities awarded to different categories of need and the ability to wait, to sift tenants and to allocate them to different types of estates. For example the young tenants, with young families who tend to give Family Life Cycle or Social/Environmental reasons for wishing to move are more likely to be allocated to a less popular estate than an elderly, one person household who is being forced to move. This tends to perpetuate the existing social and demographic structure of estates and reinforce the differential demand which already exists.

The final chapter of analysis examines the differences between movers and non-movers but this is less satisfactory than the rest of the study because of problems of data comparability. Indeed this was only included in the belief that knowing something of the differences between those households which move and those which do not, would add to the sum of knowledge about the process of mobility. This part of the study further illustrated the importance of family life cycle changes in stimulating mobility in that the older, stable family groups with older children were found to be less likely to move, than younger household heads with children or single household heads and disrupted families of any age.

Throughout the thesis comparisons have been drawn between the findings of the present study, the general theories of residential mobility and the findings of other similar research, in particular. However, it was felt that

it would be useful at this stage to draw these points together in a brief summary. The principal findings related to the patterns of mobility were a lack of any strong sectoral bias and the importance of structural aspects in relation to the distance and direction of movement by new tenants. For transfer tenants the main aspects were the parochial nature of movement between estates, reflecting the importance of distance and the movement towards the newer and more popular areas by within estate movement.

Findings related to the process of mobility were more nebulous but were closely linked to the above patterns. The differential demand for estates arising from their varied social and physical environments created important biases in the allocations policy. Differential demand was seen in many cases to be a direct consequence of the estate's background while the level of points required for entry, the ability to wait and the categories of need assigned to tenants, determined their chances of obtaining their preferred housing. The importance in change in the life cycle in stimulating mobility was confirmed, however the influence of such a factor was not the most vital motivation for movement in all groups. Neither was the influence constant through the life cycle but tended to occur at certain crucial stages. The importance of forced moves at all levels was illustrated, as were the differences between movers and non-movers. The fact that mobility is not a uniform process for all, but varies for different households, even within a group of the population such as local authority

tenants was shown time and again.

This very brief resume is in no way intended to be a comprehensive list of the findings of this thesis but rather a succinct summary of the broad areas in which important findings were made. From this it is possible to move forward and suggest areas for future research. No study of this nature can hope to cover all areas of a topic for, as the study develops, innumerable problems pose themselves for examination. Some of these can be tackled from the existing data but others require more detailed or differently oriented information. Three major topics arising out of the current research can be suggested for future study, viz.:

1) The influence of Involuntary movers has been noted here. This may be partly of historical importance but it would seem worthwhile to investigate further the types of households involved. Also, as these households appeared to command a high priority in relation to other tenants an assessment of the level of realization of their choices might prove enlightening.
2) In the examination of within estate moves some measure of the satisfaction of tenants in relation to their areas of rehousing was made. This topic could be usefully extended to all transfer tenants and satisfaction levels in terms of both areas and types of housing could be measured. This would provide a profile of those movers who have their desires frustrated by the institutional constraints within the public housing system and an assessment of how the system fails to allow their desired

residential mobility.

3) Closely related to these two, is the need for an examination of those who are unsuccessful movers. The present study has only dealt with those who were successful in moving. Little is known about those who apply for entry to the council sector or who apply for transfers within it, but are totally unsuccessful. It would seem sensible to know more about those who are excluded and those who become trapped.

Apart from these three general research areas the present study suggests several policy implications. These are by no means innovative but the fact that they are again emphasized, would appear to confirm their lasting importance.

1) Comprehensive action for the upgrading of the worst estates is required to help to diminish the differential demand which exists at present. Such a change would make the points system much more fair.

2) There is a need to take account of the existing preferences of tenants in any future development. The popularity of cottage type housing would suggest the need for a greater future provision of this type, land availability permitting.

3) The strong parochial movement of local authority tenants suggests that there is a need to create a balance of housing types within estates or at least within groups of estates. This would allow for the changes of housing needs which arise through the life cycle to be met within a local area. This in turn would go far towards strengthening community feelings in an area.

4) With the recent move to sell council housing, there is a need to protect the general level of quality of the total stock, and to prevent a narrowing down of the choices available to remaining tenants.

5) Finally there would seem to be a need to meet the demand for places within the local authority sector by applicants with social needs. At present such families are often discriminated against by rules which at the same time discourage self-help and allow those in the know to "play the system".

APPENDICES

Appendix 4.1

Kolmogorov-Smirnov two-sample test comparing the distribution of enumeration districts and the number of origins over nine social classes.

Null Hypothesis: H_o states that there is no difference in the distribution of enumeration districts from the distribution of origins.

H_1 states that the two distributions are different.

$N_1 = 1221$ $N_2 = 329$ Level of significance = 0.01

Social Class	LL	LM	LH	ML	MM	MH	HL	HM	HH
No. of e.d.s	271	489	89	92	162	27	43	44	4
No. origins	66	166	35	9	39	4	2	7	1
Cumulative	271	760	849	941	1103	1130	1173	1217	1221
Totals	66	232	267	276	315	319	321	328	329
Proportions	0.22	0.62	0.69	0.77	0.90	0.92	0.96	0.99	1.00
	0.20	0.70	0.81	0.83	0.95	0.96	0.97	0.99	1.00
Differences	0.02	0.12	0.12	0.06	0.05	0.04	0.01	0.00	0.00

To test significance at 0.01 level.

$$D = \text{maximum } (Sn_1(X) - Sn_2(X)) \quad \text{i.e. } D = 0.12$$

From Table M p. 279 (Siegel;1956)

at 0.01 level $D = 1.63 \sqrt{\frac{n_1 + n_2}{n_1 n_2}}$

$= 1.63 \sqrt{\frac{1550}{401709}}$

$= 1.63 \sqrt{0.0038585}$

$= 1.63 \times 0.062$

$= 0.10$

Thus as 'D' for the sample is greater than the value computed from the table it is possible to reject H_o with 99% certainty.

The Kolmogorov-Smirnov two sample test is a test of whether two independent samples have been drawn from the same population (or from populations with the same distribution). The tests are sensitive to any kind of difference in the distributions from which the two samples were drawn. Both the one and two sample tests are concerned with the agreement between two cumulative distributions. If the two samples have in fact been drawn from the same population distribution, then the cumulative distributions of both samples may be expected to be fairly close to each other, inasmuch as they both should show only random deviations from the population distribution. If the two sample cumulative distributions are "too far apart" at any point, this suggests that the samples come from different populations. Thus a large enough deviation between the two sample cumulative distributions is evidence for rejection H_o (Siegel, 1956 pp 127-128).

Appendix 4.2

Kolmorogov-Smirnov Two sample test on the Origins of the two groups of movers into Local Authority housing.

Null Hypothesis: H_o states that there is no difference between the two groups as regards their origins over the nine social areas.

H_1 states that the two groups have different origins.

$N_1 = 223$ $N_2 = 106$ Level of significance = 0.01.

From calculation as above (Appendix 4.1)

$D = \text{maximum} (Sn_1 (X) - Sn_2 (X))$ $D = 0.44$

From table M p. 279 (Siegel; 1956) as above (Appendix 4.1)
$D = 0.192$

Thus as 'D' for the sample is greater than the value computed from the table it is possible to reject H_o with 99% certainty.

Appendix 4.3

Kolmogorov-Smirnov One Tailed Test of the Distribution of Age of Household Head for Private rental and shared Accommodation.

Null Hypothesis; H_o states that the distribution of ages in the two groups is similar. H_1 states that those moving from shared accommodation are younger.

$N_1 = 223$ $N_2 = 106$ Level of Significance = 0.01

Ages	15 - 29	30 - 44	45 - 59	60+	
P.R.	56	55	62	50	Occurrences
SHRD.	68	25	6	7	
P.R.	56	111	173	223	Cumulative Totals
SHRD.	68	93	99	106	
P.R.	.25	.49	.77	1.00	Proportions
SHRD.	.64	.87	.93	1.00	
	-.39	-.38	-.16	0.00	Differences

D = maximum $(Sn_1 (X) - Sn_2 (X))$ in required direction.

To test at 0.01 level of significance Formula 6.11 p.133 (Siegel;1956)

$$\chi^2 = \frac{4D^2 (n_1 n_2)}{n_1 + n_2}$$

$$= \frac{4 \times 0.1521 (23638)}{329}$$

$$= \frac{14381.36}{329}$$

$$= 43.71$$

For df = 2 and significance level 0.01 $\chi^2 = 9.21$ (Table C, p.249; Siegel; 1956). H_o can be rejected with 99% certainty and H_1 accepted i.e. that those moving from shared accommodation are younger than those from private rental.

A Kolmogorov-Smirnov test was used here in preference to chi-square due to the ordinal nature of the data.

Appendix 4.4

Non-economically Active Household Heads - Chi-square Test.

H_o states that the distribution of persons in these categories is similar for both groups. H_1 states that the distribution is different for the two groups. Level of significance = 0.01.

	Shared		Private Rental	
	Observed	Expected	Observed	Expected
Unemployed	9	8	12	13
Retired	5	12	26	19
Housewives	13	8	7	12

$$\chi^2 = \sum_{i=1}^{r} \sum_{j=1}^{k} \frac{(O_{ij} - E_{ij})^2}{E_{ij}}$$

$$= \frac{(9-8)^2}{8} + \frac{(12-13)^2}{13} + \frac{(5-12)^2}{12} + \frac{(26-19)^2}{19} + \frac{(13-8)^2}{8} + \frac{(7-12)^2}{12}$$

$$= .13 + .07 + 4.08 + 2.58 + 3.13 + 2.08$$

$$= \underline{12.07}$$

Degrees of Freedom $df = (r-1)(k-1)$

$= 2 \times 1$

$= 2$

χ^2 from Table C, p.249 (Siegel; 1956) at df = 2 and significance level = 0.01. $\underline{\chi^2 = 9.21}$

H_o can be rejected with 99% certainty.

Appendix 4.5

Chi-square test on Reasons for moving.

Null Hypothesis H_o states that reasons for moving will be the same for both groups. H_1 states that reasons will be different for the two groups. Level of significance = 0.01.

From calculation as in Appendix 4.4 $\chi^2 = 64.33$

From Table C,p.249 (Siegel;1956) at df = 5 and significance level = 0.01 $\chi^2 = 15.09$

$\therefore$ H_o can be rejected with 99% certainty and H_1 accepted.

Appendix 4.6

Chi-square test on Marital Status

Null Hypothesis H_o states that marital status will be the same for the two groups. H_1 states that marital status will vary between those from shared and those from private rental. Level of significance = 0.01

From calculation as in Appendix 4.4 $\chi^2 = 1.34$

From Table C, p.249 (Siegel;1956) at df = 3 and significance level = 0.01 $\chi^2 = 11.34$

$\therefore$ H_o cannot be rejected.

Appendix 4.7

Chi-square test on Number of Persons in the Household

Null Hypothesis H_o states that the number of persons in the household will be the same for the two groups. H_1 states that the number of persons in the household will vary between those in shared and those in private rental accommodation.

Level of significance = 0.01.

From calculation as in Appendix 4.4 $\chi^2 = 10.86$

From Table C, p.249 (Siegel:1956) at df = 5 and significance level = 0.01 $\chi^2 = 15.09$

$\therefore$ H_o cannot be rejected.

Appendix 4.8

Chi-square test on Socio-economic group of movers

H_o states that there is no difference between those from shared accommodation and those from private rental in terms of their socio-economic status. H_1 states that the two groups differ in terms of their socio-economic status. Level of significance = 0.01.

From calculation as in Appendix 4.4 $\chi^2 = 11.64$

From Table C, p.249 (Siegel;1956) at df = 4 and significance level = 0.01 $\chi^2 = 13.28$

$\therefore$ H_o cannot be rejected.

Appendix 4.9

Kolmogorov-Smirnov One Tailed Test of the Distribution of Distances for Private Rental and Shared Accommodation.

Null Hypothesis: H_o states that the distances moved by the two groups are of similar magnitude.

H_1 states that the distances moved by those in shared accommodation are shorter than those moved by households from private rental.

$N_1 = 223$ $N_2 = 106$ Level of Significance = 0.01

From calculation as in Appendix 4.3 $D = -0.19$

From test as in Appendix 4.3 $\chi^2 = 10.06$

For df=2 and significance level 0.01, $\chi^2 = 9.21$

H_o can be rejected with 99% certainty. H_1 is thus accepted i.e. the distances moved by those from shared accommodation are shorter than those moved by households

from private rental.

Appendix 4.10

Kolmogorov-Smirnov Two sample test comparing the distribution of Origins and Destinations by Sectors.

Null Hypothesis: H_o states that there is no difference between the two distributions.

H_1 states that the distribution of origins and destinations by sectors is different. N_1 , N_2 = 329. Level of significance = 0.01.

From calculation as in Appendix 4.1 $D = +0.14$

From test as in Appendix 4.1 $\chi^2 = 0.12$

Thus as 'D' for the sample is greater than the value computed from the test it is possible to reject H_o with 99% certainty.

Appendix 4.11

Comparisons of Moves into Sectors with the Distribution of Local Authority Housing.

Null Hypothesis: H_o states that there is no difference between the two distributions. H_1 the distribution of Local Authority housing is different from the distribution of destinations from Private rental, Shared Accommodation and both together.

Private Rental From Calculation $D = 0.09$

At significance level 0.01 from Table M p.279 (Siegel;1956)

$$D = 1.63 \sqrt{\frac{n_1 + n_2}{n_1 \; n_2}}$$

$$= 1.63 \sqrt{\frac{50855}{11290936}}$$

$$= 1.63 \times 0.067$$

$$= 0.109$$

$\therefore$ H_o cannot be rejected at the 0.01 level of significance.

Shared Accommodation

From calculation D = 0.14

From Table as above $D = 1.63 \sqrt{\frac{50738}{5366992}}$

$= 1.63 \times 0.097$

$= 0.158$

∴ H_o cannot be rejected at the 0.01 level of significance.

Private Rental and Shared Accommodation

From calculation D = 0.08

From Table as above $D = 1.63 \times 0.074$

$= 0.12$

∴ H_o cannot be rejected at the 0.01 level of significance.

Appendix 4.12

Kolmogorov-Smirnov One Sample Test for Angle of Move

H_o states that there is no difference in the expected number of angles in each group and that any observed differences are merely chance variations.

H_1 states that the frequencies are not all equal.

N = 329 Level of Significance = 0.01.

Angles	0-29	30-59	60-89	90-119	120-149	150-180
Observed(S)	48	55	67	50	38	71
Theoretical(F)	55	55	55	55	55	55
Cumulative Distribution						
$F_o(X)$	.16	.33	.50	.66	.83	1.00
$S_{329}(X)$	.14	.31	.51	.66	.78	1.00
$\left[F_o(X)-S_{329}(X)\right]$	.02	.02	.01	.00	.05	.00

$D = \text{maximum } \left[F_o(X) - S_{329}(X)\right]$ D=0.05

From Table E p.251 (Siegel;1956) At significance level 0.01

$$D = \frac{1.63}{\sqrt{N}}$$

$$= \frac{1.63}{\sqrt{329}}$$

$$= 0.089$$ H_o cannot be rejected at 0.01 level.

Private Rental

From calculation as above $D = 0.09$ From Table as above

$$D = \frac{1.63}{\sqrt{N}} = \frac{1.63}{14.93} = 0.109$$

H_o cannot be rejected at 0.01 level

Shared Accommodation

From calculation as above $D = 0.100$ From Table as above

$$D = \frac{1.63}{\sqrt{N}} = \frac{1.63}{10.29} = 0.158$$

H_o cannot be rejected at 0.01 level

Appendix 4.13

Kolmogorov-Smirnov Two Sample test comparing the distribution of angles for Commuter Axis and C.B.D.Axis

	0-29°	30-59°	60-89°	90-119°	120-149°	150-180°
Commuter	13	14	16	12	5	10
C.B.D.(Shrd.)	16	23	16	26	12	13
Cumulative Totals	13	27	43	55	60	70
	16	39	55	81	93	106
Proportions	.18	.38	.61	.78	.85	1.00
	.15	.36	.52	.76	.87	1.00
Differences	.03	.02	.09	.02	.02	0.00

$D = \text{maximum } (Sn_1(X) - Sn_2(X))$ i.e. $D = 0.09$

Null Hypothesis; H_o states that there is no difference between the two distributions. H_1 states that the two distributions are different.

$N_1 = 70$ $N_2 = 106$ Level of Significance = 0.01.

At 0.01 level from Table M, p.279 (Siegel; 1956)

$$D = 1.63 \sqrt{\frac{n_1 + n_2}{n_1 \ n_2}}$$

$$= 1.63 \sqrt{\frac{176}{7420}}$$

$$= 1.63 \times 0.15$$

$$= \underline{0.25}$$

$\therefore$ H_o cannot be rejected at the 0.01 level.

Compared with Private Rental and Shared (C.B.D.)

From calculation as above $\underline{D = 0.12}$

From Table as above $\underline{D = 0.21}$

$\therefore$ H_o cannot be rejected at 0.01 level.

Commuter Axis/Theoretical Distribution

From calculation $\underline{D = 0.12}$

From Table E, p.251 (Siegel; 1956) At significance level 0.01

$$D = \frac{1.63}{\sqrt{N}}$$

$$= \frac{1.63}{8.36}$$

$$= \underline{0.19}$$

$\therefore$ H_o cannot be rejected at 0.01 level.

Appendix 5.1. Correlation of Number of Transfer Tenants and Number of Cottages in Estates.

Correlation Coefficient, $r = \dfrac{\Sigma xy - \bar{x}.\bar{y}}{n}$ (Product Moment)

$\sigma x.\ \sigma y$

(Gregory, 1963, p.192)

x = transfers

y = cottages

n = 30

$$\bar{x} = \frac{\Sigma x}{n} = \frac{-20}{30} = -0.67$$

$$\bar{y} = \frac{\Sigma y}{n} = \frac{+7}{30} = +0.23$$

$$\bar{x}.\bar{y} = -0.15 \qquad \frac{\Sigma xy}{n} = \frac{+129,665}{30} = 4,322.17$$

$$\sigma x = \sqrt{\frac{\Sigma x^2}{n} - \bar{x}^2} = \sqrt{\frac{36900}{30} - 0.4489} = 35.06$$

$$\sigma y = \sqrt{\frac{\Sigma y^2}{n} - \bar{y}^2} = \sqrt{\frac{1655243}{30} - 0.0529} = 234.89$$

$$\therefore r = \frac{4,322.17 - (-0.1541)}{35.06 \times 234.89}$$

$$= \frac{4322.3241}{8235.2434}$$

$$= +0.918$$

Significance of r test (Gregory, 1963, p.200)

$$t = r.\ \frac{\sqrt{n-2}}{1-r^2}$$

degrees of freedom = n-2 = 28

$$= +0.918.\ \frac{\sqrt{30-2}}{1-(0.918)^2}$$

$$= \frac{0.918 \times 5.29}{1 - 0.842724}$$

$$= 30.87$$

$\therefore$ correlation is significant at 0.1% level (Fig. 30 p 139, Gregory, 1963)

Appendix 5.2. Correlation of Number of Flats and Number of New Tenants in Estates.

Correlation Coefficient, $r = \dfrac{\frac{\Sigma xy}{n} - \bar{x}.\bar{y}}{\sigma x.\ \sigma y}$

(Gregory, 1963, p.192)

x = no. of flats

y = no. of new tenants

n = 30

$\bar{x} = \dfrac{\Sigma x}{n} = \dfrac{-8}{30} = \underline{-0.27}$

$\bar{y} = \dfrac{\Sigma y}{n} = \dfrac{12}{30} = \underline{+0.40}$

$\underline{\bar{x}\bar{y} = -0.108}$ $\qquad \dfrac{\Sigma xy}{n} = \dfrac{1.844,328}{30} = \underline{61,477.6}$

$\sigma x = \sqrt{\dfrac{\Sigma x^2}{n} - \bar{x}^2} = \sqrt{\dfrac{22025446}{30} - 0.0729} = \underline{856.84}$

$\sigma y = \sqrt{\dfrac{\Sigma y}{n} - \bar{y}^2} = \sqrt{\dfrac{191208}{30} - 0.16} = \underline{79.83}$

$$\therefore\ r = \frac{61477.6 - (-0.108)}{856.84 \times 79.83}$$

$$= \frac{61477.708}{68401.537}$$

$$= \underline{\underline{+0.89}}$$

Significance of r test (Gregory, 1963, p.200)

$$t = r.\ \frac{\sqrt{n-2}}{1 - r^2}$$

degrees of freedom = $\underline{n - 2 = 28}$

$$= 0.89\ .\ \frac{28}{1 - (0.89)^2}$$

$$= \frac{0.89 \times 5.29}{0.2079}$$

$$= \underline{22.64}$$

$\therefore$ correlation is significant at 0.1% level (Fig. 30 p 139, Gregory. 1963)

Appendix 5.3.

a) Kolmogorov - Smirnov One Tailed Test of the Distribution of Number of Apartments in Inter-war and Post-war Estates.

Null Hypothesis, H_0 states that the distribution of dwelling sizes is similar for both groups. H_1 states that the two distributions differ and that the inter-war group has smaller dwellings.

$N_1 = 4024$ $N_2 = 1688$ Level of Significance = 0.01

From calculation as in Appendix 4.1

$$D = -0.13$$

From test as in Appendix 4.1

$$\chi^2 = 80.38$$

For df=2 and significance level 0.01, $\chi^2 = 9.21$ (Table C, p249, Siegel, 1965) $\therefore$ H_0 can be rejected with 99% certainty and H_1 accepted i.e. that inter-war estates have more smaller dwellings and fewer large dwellings than post-war estates.

Appendix 5.3.

b) Kolmogorov - Smirnov One Tailed Test of the Distribution of Age of Household Head for Inter-war and Post-war Estates.

Null Hypothesis, H_0 states that there is no differences in the distribution of age groups in the two groups. H_1 states that post-war schemes generally have younger household heads than inter-war schemes.

$N_1 = 1702$ $N_2 = 3904$ Level of Significance = 0.01

From calculation as in Appendix 4.1

$$D = -0.13$$

From test as in Appendix 4.1

$$\chi^2 = 80.12$$

For df = 2 and significance level 0.01 then χ^2 = 9.21 (Table C, p249, Siegel, 1956).

$\therefore$ H_0 can be rejected with 99% certainty.

Appendix 5.3.

c) Chi-square test on Movers and Non-movers in Inter-war and Post-war Schemes.

H_0 - there will be no difference in the numbers of movers and non-movers in the two groups. H_1 - the numbers will vary between the two.

Level of significance = 0.01.

From calculation as in Appendix 4.4 $\chi^2 = 123.72$

From Table C p.249 (Siegel. 1956) at df = 1 and significance level = 0.01 then $\chi^2 = 6.64$

$\therefore$ H_0 can be rejected with 99% certainty and H_1 accepted.

Appendix 5.3.

d) Kolmogorov - Smirnov One Tailed Test of the Distribution of Socio-economic Groups in Inter-war and Post-war Estates.

H_0 - states that there is no difference between the two groups.

H_1 states that those in post-war estates are of a higher S.E.G.

n_1 = 3107 n_2 = 1285 Level of Significance = 0.01

From calculation as in Appendix 4.3

$D = +0.06$

From test as in Appendix 4.3

$\chi^2 = 12.81$

For df = 2 and significance level = 0.01 then from Table C p.249 (Siegel, 1956) $\chi^2 = 9.21$

$\therefore$ H_0 may be rejected with 99% certainty and H_1 accepted.

Appendix 5.3.

e) Chi-square Test on the Status of Householders in Inter-war and Post-war Estates.

H_0 states that there is no difference between the two groups.

H_1 states that there will be differences in status in the two groups.

Level of Significance = 0.01

From calculation as in Appendix 4.4 $\chi^2 = 109.17$

For df=3 and significance level 0.01 then $\chi^2 = 11.34$ (Table C, p.249, Siegel. 1956).

$\therefore$ H_0 can be rejected with 99% certainty and H_1 accepted.

Appendix 5.3.

f) Chi-square Test on the Previous Tenure of Tenants in Inter-war and Post-war Estates.

H_0 states that both groups of tenants will have held similar previous tenancies. H_1 states that there will be differences between the two groups.

Level of Significance = 0.01

From calculation as in Appendix 4.4 $\chi^2 = 60.98$

For df = 4 and level of significance 0.01 then $\chi^2 = 13.28$ (Table C, p.249, Siegel 1956).

$\therefore$ H_0 can be rejected with 99% certainty and H_1 accepted.

Appendix 5.3.

g) Chi-square Test on Reasons for Moving into Inter-war and Post-war Estates.

H_0 states that there will be no difference in the reasons given by the two groups. H_1 states that the two groups will have

different reasons for moving. Level of Significance = 0.01.

From calculation as in Appendix 4.4. $\chi^2 = 37.55$

For df = 4 and level of significance 0.01 then $\chi^2 = 13.28$.

(Table C, p.249, Siegel; 1956)

$\therefore$ H_0 can be rejected with 99% certainty and H_1 accepted.

Appendix 5.4

(a) Chi-square Test on Status of Householders in Old and Young Estates.

H_0 states that there is no difference between the two groups in terms of status. H_1 states that the status of householders varies between the two groups of estates. Level of significance = 0.01. From calculation as in Appendix 4.4. $\chi^2 = 85.08$

For df = 3 and level of significance 0.01 then $\chi^2 = 11.34$.

(Table C, p.249 Siegel 1956)

$\therefore$ H_0 can be rejected with 99% certainty and H_1 accepted.

Appendix 5.4

(b) Kolmogorov-Smirnov One tailed Test on the Distribution of Number of Apartments in Old and Young Estates.

H_0 states that the distribution of dwelling sizes is similar for both groups. H_1 states that the two distributions will differ and that the old estates will have smaller dwellings.

$N_1 = 3153$ $N_2 = 581$ Level of Significance = 0.01.

From calculation as in Appendix 43. $D = -0.17$

From test as in Appendix 4.3. $\chi^2 = 56.71$

For df = 2 and significance level 0.01 then $\chi^2 = 9.21$ (Table C, p.249, Siegel; 1956)

$\therefore$ H_0 can be rejected with 99% certainty and H_1 accepted.

Appendix 5.4

c) Chi-square Test on the Size of Households in Old and Young Estates

H_0 states that households are of similar sizes in both groups.

H_1 states that there are differences between the two groups.

Level of Significance = 0.01.

From calculation as in Appendix 4.4 $\chi^2 = 57.21$

For df = 1 and significance level 0.01 then $\chi^2 = 6.64$ (Table C, p.249, Siegel, 1956).

$\therefore$ H_0 can be rejected with 99% certainty and H_1 accepted.

Appendix 5.4

d) Chi-square Test on the Numbers of Movers and Non-movers in Old and Young Estates.

H_0 states that there is no difference in the numbers of movers and non-movers in the Old and Young estates. H_1 states that there are differences between the two groups of estates. Level of Significance = 0.01.

From calculation as in Appendix 4.4 $\chi^2 = 114.33$

For df = 1 and significance level 0.01 then $\chi^2 = 6.64$.

(Table C, p.249, Siegel 1956)

$\therefore$ H_0 can be rejected with 99% certainty and H_1 accepted.

Appendix 5.4.

e) Chi-square Test on the Previous Tenancy of Tenants in Old and Young Estates.

H_0 states that there is no difference between householders in the two groups of estates in terms of their previous tenancy.

H_1 states that there are differences in previous tenure in the two groups. Level of Significance = 0.01.

From calculation as in Appendix 4.4 $\chi^2 = 72.50$

For df = 4 and significance level 0.01 then $\chi^2 = 13.28$ (Table C, p.249, Siegel, 1956).

$\therefore$ H_0 can be rejected with 99% certainty and H_1 accepted.

Appendix 5.4.

f) Chi-square Test on the Reasons for Moving into Old and Young Estates.

H_0 states that there is no difference in the reasons given for moving by the two groups. H_1 states that the two groups do differ in their reasons for moving. Level of significance = 0.01.

From calculation as in Appendix 4.4 $\chi^2 = 28.75$

For df = 4 and level of significance 0.01 then $\chi^2 = 13.28$ (Table C, p.249, Siegel, 1956).

$\therefore$ H_0 can be rejected with 99% certainty and H_1 accepted.

Appendix 5.4.

g) Chi-square Test on the Types of Housing in Old and Young Estates.

H_0 states that there is no difference in the type of housing on the two groups of estates. H_1 states that there is a difference in the type of housing in Old and Young estates. Level of significance = 0.01.

From calculation as in Appendix 4.4 $\chi^2 = 960.76$

For df = 2 and level of significance 0.01 then $\chi^2 = 9.21$ (Table C, p.249, Siegel, 1956).

$\therefore$ H_0 can be rejected with 99% certainty and H_1 accepted.

Appendix 5.5.

a) Kolmogorov - Smirnov One Tailed Test of the Ages of Household Heads in Popular and Unpopular Estates.

H_0 states that householders in both groups will be of similar ages. H_1 states that householders in the unpopular estates will be younger than those in the popular estates. Level of Significance = 0.01. $N_1 = 1128$ $N_2 = 2566$.

From calculation as in Appendix 4.3 $D = -0.24$

From test as in Appendix 4.3. $\chi^2 = 180.53$

For df = 2 and level of significance 0.01 then $\chi^2 = 9.21$ (Table C, p.249, Siegel, 1956)

$\therefore$ H_0 can be rejected with 99% certainty and H_1 accepted.

Appendix 5.5.

b) Chi-square Test of Previous Tenure of Tenants of Popular and Unpopular Estates.

H_0 states that there is no difference in terms of previous tenure between the two groups. H_1 states that there is a difference between the two. Level of Significance = 0.01.

From calculation as in Appendix 4.4 $\chi^2 = 137.52$

For df = 4 and level of significance 0.01 then $\chi^2 = 13.28$ Table C, p.249, Siegel, 1956).

$\therefore$ H_0 can be rejected with 99% certainty and H_1 accepted.

Appendix 5.5.

c) Chi-square Test of Reasons for Moving into Popular and Unpopular Estates.

H_0 states that there is no difference between the two groups in terms of the reasons given for their moving. H_1 states that there are differences in the reasons given for moving by the two groups.

Level of significance = 0.01.

From calculation as in Appendix 4.4 $\chi^2 = 41.32$

For df = 4 and level of significance 0.01 then $\chi^2 = 13.28$ (Table C, p.249, Siegel 1956).

$\therefore$ H_0 can be rejected with 99% certainty and H_1 accepted.

Appendix 5.5.

d) Chi-square Test on the Status of Householders in Popular and Unpopular Estates.

H_0 states that there is no difference in the status of householders in the two groups. H_1 states that there are differences between the two. Level of Significance = 0.01.

From calculation as in Appendix 4.4 $\chi^2 = 73.92$

For df = 3 and level of significance 0.01 then $\chi^2 = 11.34$ (Table C, p.249, Siegel 1956).

$\therefore$ H_0 can be rejected with 99% certainty and H_1 accepted.

Appendix 5.6

Edinburgh Corporation

Housing Department - Letting Regulations

1 Admission to Rehousing List

To qualify, applicants must either be employed or live within the City. Aged persons living outwith Edinburgh who have family ties within the City may apply.

2 Points Scheme for Applicants

Points will be awarded as follows:

Bedroom Deficiency 4 points will be given for each bed space deficient subject to:

(a) each bed space having a minimum of 60 square feet

(b) applicant and wife occupying one room

(c) not more than two children occupying any other bedroom.

Under-occupation A maximum of 5 points will be given where there is more than one bed space surplus to requirements

Shared Facilities The following number of points will be awarded for shared facilities:

Kitchen	3
WC	3
Bathroom/Shower	2
Living Room	2
Combined Living/Sleeping Area	3

Lack of Amenities The following number of points will be awarded for:

Separate Kitchen	2
Separate Bathroom	3
Inside WC	2
Hot Water	3
Wash Hand Basin	2

Other Circumstances Points awarded for age of householder or spouse, if older as follows:

Age 50s	1
60s	2
70s	3
80s	4
90s	5

1 point for each two months' waiting period from the date on which the application was lodged.

Up to 20 points awarded for medical or disabled cases as assessed by the Medical Officer of Health or Area Health Officer.

Special Circumstances Up to 15 points MAY BE awarded in special circumstances for one or more of the categories listed below:

	Points awarded in each category
Families with children attending special schools	5
Members of the family attending special institutions	4
Those wishing to be nearer relatives due to sickness or disablement	7
Shift workers	3
Households in high flats (5th storey and above) with children under 10 years of age	3 for each child
Households requiring a move due to a member of the family being in prison	4
Households wishing to return to an area in which they have lived for a period in excess of 6 years	5
Families fostering children	3 for each child
Ex-tenants returning to the City	3
Single persons of the same sex wishing to share accommodation	3

In special cases, not outlined above, the circumstances may be referred to the House Letting and Loans Sub-Committee where up to 15 points may be awarded.

3 Demolition of Property

Rehousing of families in dwellings below the tolerable standard and within Housing Treatment Areas for demolition and those properties required for highways or planning purposes will be cleared at the rate of 1500 houses per year and the necessary housing for this programme will be made available from both new dwellings coming into management and re-lets. Where an applicant has been on the waiting list, allocation can either be made according to the priorities of the points scheme or according to the clearance programme.

4 Occupants of Dangerous Properties

Cases arising from action under the legislative provisions requiring the taking down or securing of dangerous buildings will be dealt with as in 3 above. Tenants and sub-tenants are housed temporarily upon certificate by the City Engineer that they must be removed immediately and they are required to return to their original accommodation if and when the buildings are made secure.

5 Service Tenancies

Persons formerly occupying houses on a service tenancy or occupancy basis and members of HM Forces in married quarters will be awarded points for half the waiting period while in occupation of this type of accommodation, but consideration MAY BE given to widows in exceptional cases of hardship.

6 Homeless

Families who become homeless will be pointed according to their current circumstances. Families who are in temporary emergency accommodation are treated as homeless families.

7 Temporary Residence Outwith Edinburgh

Applicants who, after lodging an application, become resident and employed in other areas will have the period or residence and employment in the other areas deducted from the total waiting period except where they are required by their employers to leave the City temporarily in connection with their employment and such absence does not exceed two years. If the period of absence, subject to the

exception mentioned, exceeds twelve months, the Edinburgh application is automatically cancelled.

8 Single Person

Single persons under 18 years of age may make application to the rehousing list, but only in very special cases will tenancies be granted for those still under 18 years. Single persons over 18 will not normally be granted tenancies in precedence to married couples or elderly single persons.

9 Cohabitation

Cohabitation is considered in the same way as a married couple where evidence is given that both parties have been living together for at least one year.

10 The Applicant's Family

The persons who are considered as forming the applicant's family, in addition to the wife or husband as the case may be, are:

(a) unmarried sons and daughters

(b) adopted children, children in care, children fostered and children permanently with the applicant

(c) aged and/or infirm parents who are unable to maintain themselves

(d) widowed or divorced or separated sons and daughters who are considered as having resumed single status

(e) points are allowed to guardians in respect of children permanently in care of applicant or who are fostered out by a local authority.

11 Owner-Occupiers

Owner-occupiers becoming eligible for a tenancy are not required to accept as a tenant of their house an applicant from the Corporation's waiting list.

12 Transfer Applications

Applicants living in municipal housing who wish a transfer will also be pointed as for applicants on the rehousing list. Applications for direct exchanges will be considered.

13 Transfer of Applications

No allowance for waiting period is granted in respect of applications which have been lodged with other local authorities.

14 Cancellation of Application

The Housing Information Schedule contains a clause warning applicants about supplying false information and applications may be cancelled in the following circumstances:

(a) Knowingly supplying false information or the withholding of relevant information either on the application form or at subsequent interviews

(b) Applicants are required to inform the Housing Department of any change in family circumstances or change of address

(c) Repeated failure to reply to communications sent by the Department.

15 Applicants with Rent Arrears

Applicants who have held no prior tenancy with the Corporation of Edinburgh will be asked to give evidence of previous landlords' addresses and references may then be made to these persons concerning the applicant's rent record.

Written communications concerning the above Regulations should be addressed to the Director of Housing, City Chambers, Edinburgh EH1 1PW.

Appendix 6.1. Anderson and Goodman's Maximum Likelihood Criterion Ratio Test for Markov Property.

H_0 The movement of people from one location to another is statistically independent.

H_1 The movement is not statistically independent i.e. Markovian.

$$\chi^2 = -2\ln\lambda = -2 \sum_{i=1}^{n} \sum_{j=1}^{n} f_{ij} \ln (P_j / P_{ij})$$

From data $\chi^2 = 1{,}738.32$

$df = (n-1)^2 = 29 \times 29 = 841$

For df >>30 then

As $Z = \sqrt{2\chi^2} - \sqrt{2df - 1}$

then $\chi^2 = \dfrac{(Z + \sqrt{2df - 1})^2}{2}$ $\qquad Z_{.05} = 1.64$

$$= \frac{(1.64 + 41)^2}{2}$$

$$\chi^2 = \underline{\underline{909}}$$

$\therefore$ as χ^2 for data here is 1,738.32 then the null hypothesis can be rejected.

SPATIAL MATRIX

MATRIX OF MEAN FIRST PASSAGE TIMES

M MATRIX

DESTINATION

ORIGIN

1.	5,73541	16,65087	154,12474	37,57721	48,45728	73,71240	128,74171	36,35173
	36,10096	1565,33350	54,23059	39,08537	106,66811	69,95328	52,28929	57,21428
	138,09126	39,27014	21,07786	197,42296	786,38477	24,47993	24,83308	137,68865
	88,24159	126,36432	98,06697	320,48486	1958,59937	981,79272		
2.	8,37827	12,66892	154,49405	38,29390	49,11594	64,28629	128,75517	38,23241
	39,26088	1569,28394	55,43536	43,03517	109,37643	72,21045	56,06479	48,17871
	138,91739	40,68030	13,28918	198,31701	788,15698	29,14427	23,15366	138,80231
	79,24033	129,31140	97,96971	313,96874	1959,31567	983,28313		
3.	10,83284	17,95863	134,22504	29,87651	47,62134	74,36982	123,98273	31,92894
	40,12083	1568,21926	53,24069	41,96985	107,16785	69,86288	52,85223	57,15369
	135,63751	38,65764	23,23289	151,35872	786,86836	30,35135	24,77824	122,31599
	85,16759	126,87677	93,41194	321,34948	1958,89814	981,18842		
4.	12,86881	20,88521	152,80331	12,25826	46,26785	75,65528	109,22661	36,37688
	40,51218	1570,01221	49,74002	43,76332	104,71167	66,71997	54,10858	58,98817
	129,47126	45,31089	20,39981	185,36949	783,48626	30,73863	29,58842	136,34967
	87,38778	126,15874	81,20018	324,88439	1921,82197	987,53369		
5.	12,66685	21,98633	154,24871	28,19894	29,33873	77,49413	119,74609	33,94881
	40,89163	1568,18278	33,40138	41,85423	101,35719	59,97758	52,72847	59,18294
	134,88771	44,33121	20,30418	185,94753	684,72803	28,59259	29,48351	137,88858
	87,45186	126,22858	93,53131	324,75439	1949,22895	986,85425		
6.	7,28389	16,24223	155,55791	37,87175	49,77293	44,82498	122,38981	38,42498
	39,32355	1568,97632	55,49602	42,72828	109,42692	72,15882	54,97388	53,83742
	136,70128	39,14187	19,14435	197,62659	788,31445	29,82989	24,76308	139,13681
	75,86609	129,02573	97,60842	301,18913	1958,89387	981,66382		
7.	13,71817	20,86143	153,44314	24,29915	42,52846	73,99218	74,38255	35,80423
	38,25163	1570,29395	49,70934	44,84547	106,59274	68,85959	51,47105	58,94542
	104,48764	45,61258	24,97772	176,13386	783,82373	31,43546	29,60724	132,48617
	87,78830	123,41832	80,87804	323,44995	1945,32104	988,13477		
8.	11,66700	19,62857	152,58865	35,48053	48,54869	75,71519	126,77889	19,78146
	39,55780	1559,56281	51,46779	33,31332	105,38702	66,75438	39,27909	55,59785
	133,17200	42,01305	24,18329	195,37543	784,18506	30,88506	25,45148	134,14522
	87,52126	116,92882	94,95805	321,94043	1950,50244	984,53589		
9.	13,19088	20,89740	147,63478	33,58898	44,37167	77,12146	123,17859	28,94542
	28,91854	1565,88086	50,80112	39,63225	96,38748	65,44276	42,38676	59,48149
	132,39037	44,28238	25,91791	192,66365	782,80342	23,87234	26,73877	133,52538
	88,81270	115,74239	95,67520	323,73486	1954,61868	986,80493		
10.	14,19898	21,92480	153,12321	35,24318	45,48793	77,87791	126,36392	23,18788
	31,39494	1043,44381	47,93902	38,85316	102,85648	51,95039	35,88572	59,78114
	135,28581	45,10977	26,73235	194,67388	692,94588	29,94592	28,85038	136,84559
	89,76727	121,65939	98,49434	324,61572	1956,26489	987,63281		
11.	12,72877	21,66933	153,81995	28,33315	35,99638	77,49736	116,11279	34,76189
	40,77520	1567,85205	25,77514	41,80364	133,99319	59,67668	52,43701	59,35770
	133,31618	44,64444	29,13657	181,60211	695,44507	29,19304	26,73744	137,38278
	88,76567	125,19844	92,42265	324,49219	1949,39449	987,16699		
12.	12,85920	20,19341	154,63288	35,31868	48,25644	75,99864	126,95476	22,71389
	38,62681	1526,24829	53,80992	27,45779	105,44867	68,28668	36,96558	57,51628
	133,80353	41,01541	24,65353	196,36426	788,16357	30,56129	25,89769	134,88394
	87,56386	112,16578	96,21843	322,49023	1956,34682	983,53889		
13.	15,82796	24,71228	156,81245	35,42936	38,89164	80,74062	129,54875	38,84491
	43,24266	1571,52075	48,23268	45,27193	24,36337	57,31529	55,29677	62,92667
	139,79268	47,65512	29,22673	192,44753	694,43726	27,56863	32,29811	117,65128
	91,15289	129,57399	98,28923	327,82495	1956,45117	990,17798		
14.	13,92767	21,19748	151,66516	38,18839	33,58344	77,68369	122,58826	35,61787
	41,84665	1568,71973	38,52867	42,47866	98,52222	48,49225	52,75568	59,84265
	136,38313	45,57532	26,39894	188,05676	653,15161	28,62352	29,35538	136,39125
	88,98431	127,84178	92,99138	324,87287	1951,28995	988,89839		
15.	11,88363	19,97177	154,40327	35,71422	49,44728	74,99869	127,88627	22,18762
	38,17488	1560,24463	53,68881	33,09577	105,20824	69,60361	26,21440	57,96188
	133,19598	42,56779	24,62868	196,59549	786,44214	30,40219	24,65544	134,11975
	87,75028	117,92484	96,35287	321,91479	1956,73633	985,89033		
16.	7,72847	14,34017	154,47714	36,28582	48,61719	69,51289	127,95438	35,47371
	38,99698	1568,27783	54,80417	42,82887	108,56117	71,38063	53,66748	49,46818
	138,26781	40,59549	17,13704	197,13356	787,42798	29,87085	23,96481	135,52739
	83,20034	128,11348	97,19097	310,29736	1957,31855	983,11816		
17.	14,21565	21,14857	154,44847	24,44595	43,87813	76,82773	94,17832	34,12224
	36,99742	1569,75849	45,33177	43,56159	100,20226	67,78528	49,84836	59,53442
	79,65681	46,87881	26,33351	187,83230	783,23950	31,36285	29,94717	135,23628
	89,83877	125,71584	79,11504	324,77563	1945,46777	988,66156		
18.	10,85527	16,88788	155,27257	35,35141	48,65331	69,16789	126,12378	36,89858
	40,19048	1569,33765	53,53876	43,88923	106,66724	65,53070	54,56651	54,70813
	131,21352	23,87038	20,40676	196,48188	785,45388	29,87649	25,88655	138,42645
	74,48915	128,76119	92,52648	318,98583	1956,37354	942,52295		
19.	8,89976	13,83766	152,25737	37,86966	48,98480	65,28999	128,42957	38,87268
	37,68687	1569,36353	55,21661	43,11581	109,86386	72,83786	54,77838	52,29163
	138,39888	42,25385	12,29879	197,01584	787,99634	29,49495	23,68688	138,65851
	77,80958	129,18524	93,58104	318,68684	1958,89111	982,77637		
20.	11,71023	22,95868	132,48078	19,76285	41,63275	76,68811	119,26427	31,33600
	40,84486	1568,46464	49,94822	42,21623	100,10488	67,81555	52,48088	59,13918
	134,82985	43,98877	25,57996	161,75594	782,82446	30,64658	28,75898	135,48628
	87,93518	126,12511	96,24991	324,87178	1948,78418	986,42318		
21.	14,23689	21,93348	153,12458	31,93297	37,66957	77,78185	123,49117	36,68336
	41,64621	1569,35450	28,76906	43,11626	101,78116	32,18287	53,58673	60,32789
	136,93954	45,74663	25,31342	189,88362	541,44849	25,31865	29,75095	137,15146
	89,85817	127,87228	94,81348	324,73482	1952,95435	988,26929		
22.	12,86138	21,36676	148,79172	32,89726	39,28881	77,24821	124,56166	34,56678
	36,83626	1566,87388	45,91881	39,82193	97,89778	60,83844	49,70786	59,75143
	135,81335	43,18869	25,97801	191,39761	696,70801	19,87585	27,99231	138,83478
	88,24632	121,45728	95,52113	324,24874	1953,11898	985,68384		
23.	8,63139	15,08695	150,77133	35,28165	49,85283	72,76224	127,36678	34,93558
	36,66632	1566,46387	53,53882	42,21562	107,68315	70,74184	52,39989	55,14867
	137,55139	42,19563	22,11821	195,36725	787,11499	29,02379	19,53392	134,51428
	84,73232	126,04493	94,70581	312,21894	1956,30322	982,71851		
24.	12,28199	19,78883	147,22913	38,17816	45,23856	74,58492	119,68844	31,82843
	37,30338	1567,04102	51,31343	40,79292	99,79608	68,22324	45,86748	56,28892
	134,26118	42,94618	23,40856	184,25481	784,20868	28,52216	27,37245	127,13318
	82,22455	125,15038	90,71918	322,13428	1951,19971	985,46924		
25.	9,75832	16,88883	150,11531	36,83974	46,49133	61,75168	125,78868	37,49661
	39,70142	1567,52562	51,30989	41,25744	108,51544	70,52358	54,11433	56,32558
	131,88851	38,25195	18,26838	196,41269	786,19555	25,58432	25,49266	138,86595
	58,92339	128,22444	96,47542	316,76947	1957,86133	980,77441		
26.	10,49881	12,24535	154,65762	34,83616	48,99382	75,58184	122,61101	26,13263
	39,13326	1565,68164	53,81848	39,43338	107,46449	69,98155	41,98157	57,87793
	114,58156	41,57187	24,12189	195,59171	786,56763	30,43202	24,12462	136,71449
	87,34436	103,43571	93,27315	321,77319	1955,85762	984,89448		
27.	12,28222	20,73987	153,42818	17,43156	43,18606	76,48628	117,84398	37,82245
	41,15735	1570,20923	48,15475	43,96117	105,89366	65,58284	54,43424	57,19817
	134,29764	45,19234	29,58452	181,54996	781,73496	30,88043	29,71857	126,78519
	87,81937	127,81458	59,57272	324,24877	1938,45361	987,68526		
28.	7,92442	18,16879	154,48956	32,42827	49,67343	63,68190	125,42276	37,46794
	39,08165	1568,56355	54,61633	42,31280	108,58471	70,97021	54,44292	57,17719
	136,66745	35,86923	22,24836	196,14273	787,46248	29,12189	19,58640	138,24562
	83,55682	126,36926	94,99249	277,17944	1953,44141	978,39233		
29.	10,37851	2,08811	156,45426	48,29414	51,11615	66,28651	136,75542	40,23268
	41,85107	1571,28394	57,43556	45,83537	111,37668	74,21066	57,88501	50,17888
	142,91765	42,68858	15,28941	230,31718	710,15747	31,14445	25,15387	140,80268
	81,84930	131,31161	99,96992	315,95898	980,65625	985,20313		
30.	8,89196	13,46363	154,95869	36,28828	48,98983	71,67943	124,23563	37,44646
	38,74123	1568,82715	54,10302	42,57635	108,78947	71,19797	54,68648	55,31114
	138,54447	36,15845	20,37586	196,68034	787,41333	29,10162	22,57254	138,30847
	83,40355	126,54189	94,45878	316,82508	1957,28149	978,69489		

Appendix 7.1.

a) Kolmogorov-Smirnov One Tailed Test of the Distribution of Age of Household Head for those Moving Within Estates from Shared Accommodation and by Transfer

Null Hypothesis, H_0 states that there is no difference in the distribution of age groups in the two groups. H_1 states that transfer tenants are older than those from Shared accommodation.

$N_1 = 147$ $N_2 = 421$ Level of Significance = 0.01

From calculation as in Appendix 4.3 $D = +0.63$

From test as in Appendix 4.3 $\chi^2 = 172.97$

For df = 2 and significance level 0.01 then $\chi^2 = 9.21$ (Table C, p 249, Siegel, 1956)

$\therefore$ H_0 can be rejected with 99% certainty and H_1 accepted.

Appendix 7.1

b) Kolmogorov-Smirnov One Tailed Test for the Distribution of Number of Persons in the Household for Within Estate Movers.

Null Hypothesis, H_0 states that there is no difference in the distribution of numbers in the household in the two groups. H_1 states that transfer tenants have larger households than those from shared accommodation.

$N_1 = 147$ $N_2 = 421$ Level of Significance = 0.01

From calculation as in Appendix 4.3 $D = +0.21$

From Test as in Appendix 4.3 $\chi^2 = 19.21$

For df = 2 and Level of Significance = 0.01 then $\chi^2 = 9.21$

(Table C, p.249, Siegel, 1956)

$\therefore$ H_0 can be rejected with 99% certainty and H_1 accepted.

Appendix 7.1

c) Kolmogorov-Smirnov One Tailed Test for the Distribution of Age of Dependents for Within Estate Movers.

Null Hypothesis, H_0 states that there is no difference in the distribution of dependents by age in the two groups of within estate movers. H_1 states that transfer tenants have older dependents than those from shared accommodation.

$N_1 = 177$ $N_2 = 736$ Level of Significance = 0.01.

From calculation as in Appendix 4.3 D = +0.39

From Test as in Appendix 4.3 $\chi^2 = 86.81$

For df = 2 and level of significance = 0.01 then $\chi^2 = 9.21$

(Table C, p.249, Siegel, 1956)

$\therefore$ H_0 can be rejected with 99% certainty and H_1 accepted.

d) Kolmogorov-Smirnov Two Tailed Test of the Distribution of Within Estate Movers by Socio-Economic Group

Null Hypothesis H_0 states that there is no difference in the distribution of socio-economic status between the two groups. H_1 states that a difference exists.

$N_1 = 110$ $N_2 = 325$ Level of significance = 0.01

From calculation as in Appendix 4.1 maximum deviation in any direction D = -0.06

From test as in Appendix 4.1 D = 0.179

$\therefore$ As D from calculation is smaller than D from test then unable to reject H_0 at 0.01 level of significance.

e) Kolmogorov-Smirnov One Tailed Test of the Distribution of Number of Apartments for Within Estate Movers, Before and After Move

Null Hypothesis, H_0 states that there is no difference between the two groups. H_1 states that households will have more

apartments after the move than before i.e. that moves are to larger houses.

$N_1 = 421$ $N_2 = 421$ Level of Significance = 0.01.

From calculation as in Appendix 4.3 $D = +0.08$

From Test as in Appendix 4.3 $\chi^2 = 5.38$

For df = 2 and level of significance = 0.01 then $\chi^2 = 9.21$

(Table C, p.249, Siegel; 1956)

$\therefore H_0$ cannot be rejected at 0.01 level of significance.

f) Kolmogorov-Smirnov One Tailed Test of the Distribution by Age of Household Head of Within and Between Estate Movers.

Null Hypothesis, H_0 states that there is no difference in age of household head for the two groups. H_1 states that those moving between estates are younger than those moving within estates.

$N_1 = 421$ $N_2 = 825$ Level of significance = 0.01.

From calculation as in Appendix 4.3 $D = -0.14$

From test as in Appendix 4.3 $\chi^2 = 21.85$

For df = 2 and level of significance = 0.01 then $\chi^2 = 9.21$

(Table C, p.249, Siegel, 1956)

$\therefore H_0$ can be rejected with 99% certainty and H_1 accepted.

g) Kolmogorov-Smirnov One Tailed Test of the Duration of Residence of those Moving Within and Between Estates.

Null Hypothesis, H_0 states that there is no difference in duration of residence for the two groups. H_1 states that those moving between estates have shorter durations of residence than those moving within estates.

$N_1 = 421$ $N_2 = 826$ Level of significance = 0.01. From calculation as in Appendix 4.3 $D = -0.17$. From test as in Appendix 4.3 $\chi^2 = 32.23$. For df = 2 and level of significance = 0.01 then

χ^2 = 9.21 (Table C, p.249, Siegel; 1956)

$\therefore$ H_0 can be rejected with 99% certainty and H_1 accepted.

h) Kolmogorov-Smirnov One Tailed Test of the Number of Apartments for Between Estates Movers Before and After Moving.

Null Hypothesis, H_0 states that there is no difference in the number of apartments which between estates movers have before and after moving. H_1 states that between estate movers will have more apartments after moving than before moving.

N_1 = 826 N_2 = 826 Level of Significance = 0.01.

From calculation as in Appendix 4.3 D = +0.10. From test as in Appendix 4.3 χ^2 = 16.52. For df = 2 and level of significance = 0.01 then χ^2 = 9.21 (Table C, p.249, Siegel; 1956).

$\therefore$ H_0 can be rejected with 99% certainty and H_1 accepted.

Appendix 7.2

a) Chi-Square Test on the Civil Status of Household Heads for Within Estate Movers.

Null Hypothesis, H_0 states that there will be no difference between those from shared accommodation and transfer tenants within estates in terms of the civil status of Household heads. H_1 states that there will be a difference between the two groups. Level of significance = 0.01. From calculation as in Appendix 4.4 χ^2 = 51.68. From Table C, p.249 (Siegel; 1956) at df = 3 and significance level = 0.01 then χ^2 = 11.34.

$\therefore$ H_0 can be rejected with 99% certainty and H_1 accepted.

b) Chi-square Test on the Distribution of Non-Economically Active Household Heads for Within Estate Movers.

Null Hypothesis, H_0 states that there is no difference between the two groups of within estate movers on the basis of their

non-economically active household heads. H_1 states that there is a difference.

Level of Significance = 0.01

From calculation as in Appendix 4.4 $\chi^2 = 11.77$

For df = 2 and level of significance = 0.01 then $\chi^2 = 9.21$

(Table C, p.249, Siegel, 1956)

$\therefore$ H_0 can be rejected and H_1 accepted with 99% certainty.

c) Chi-square Test on the Distribution of Within and Between Estate Transfers by Stage in the Life Cycle

Null Hypothesis, H_0 states that there is no difference between the two groups in terms of their stage in the Life Cycle. H_1 states that there are differences.

Level of Significance = 0.01.

From calculation as in Appendix 4.4 $\chi^2 = 26.09$

For df = 6 and level of significance = 0.01 then $\chi^2 = 16.81$

(Table C, p.249, Siegel, 1956)

$\therefore$ H_0 can be rejected with 99% certainty and H_1 accepted.

d) Chi-square Test on the Distribution of Within and Between Estate Movers by Reasons for Moving

Null Hypothesis, H_0 states that there is no difference between the two groups in terms of their reasons for moving. H_1 states that there are differences.

Level of Significance = 0.01.

From calculation as in Appendix 4.4 $\chi^2 = 92.85$

For df = 4 and level of significance = 0.01 then $\chi^2 = 13.28$

(Table C, p.249, Siegel, 1956)

$\therefore$ H_0 can be rejected with 99% certainty and H_1 accepted.

Appendix 7.3

Kolmogorov-Smirnov Two Tailed Test of the Distribution of Moves To and From Estates with Different Levels of Points Required for Entry, (Within Estate Movers)

Null Hypothesis, H_0 states that there is no difference in the moves to and from estates of different points levels. H_1 states that there is a difference.

$N_1 = 358$ $N_2 = 358$ Level of Significance = 0.01.

From calculation as in Appendix 4.1 $D = -0.01$

From test as in Appendix 4.1 $D = 0.12$

∴ As D from calculation is smaller than D from test then unable to reject H_0 at 0.01 level of significance.

Appendix 7.4

Kolmogorov-Smirnov One Tailed Test of the Distribution of Moves Into and Out of Housing by Date of Construction for Within Estate Movers.

Null Hypothesis, H_0 states that there is no difference in the numbers moving into or out of areas in relation to their housing age. H_1 states that there are more moves into newer housing than out of it.

$N_1 = 568$ $N_2 = 568$ Level of significance = 0.01.

From calculation as in Appendix 4.3 $D = +0.23$

From test as in Appendix 4.3 $\chi^2 = 60.09$

For df = 2 and significance level 0.01 then $\chi^2 = 9.21$ (Table C, p.249, Siegel, 1956)

∴ H_0 can be rejected with 99% certainty and H_1 accepted.

Appendix 8.1

Kolmogorov-Smirnov One Sample (Two Tailed) Test for the Distribution of Reasons by Age of Household Head

H_0 states that there is no difference in the expected number of reasons given for each of the twelve age groups and that any observed differences are merely chance variations to be expected in a random sample.

H_1 states that the frequencies are not equal.

N = 2113 Level of significance = 0.01.

Life Cycle Reasons

Age Classes	4	5	6	7	8	9	10	11	12	13	14	15
Observed (S)	33	222	285	276	253	218	195	150	135	127	104	115
Theoretical (F)	176	176	176	176	176	176	176	176	176	176	176	176

Cumulative Distribution

Observed	33	255	540	816	1069	1287	1482	1632	1767	1894	1998	2113
Theoretical	176	352	528	704	880	1056	1232	1408	1584	1760	1936	2112

Proportions

Observed	0.02	0.12	0.25	0.38	0.50	0.61	0.70	0.77	0.83	0.89	0.94	1.00
Theoretical	0.08	0.16	0.25	0.33	0.41	0.50	0.58	0.66	0.75	0.83	0.91	1.00

Differences $\left[F_0(X) - S_{2113}(X)\right]$

	0.06	0.04	0.00	0.05	0.09	0.11	0.12	0.11	0.08	0.06	0.03	0.00

D = maximum $\left[F_0(X) - S_n(X)\right]$ = 0.12

From Table E p.251 (Siegel, 1956) at significance level 0.01

$$D = \frac{1.63}{\sqrt{N}}$$

$$= \frac{1.63}{45.97} = 0.035$$

∴ must reject H_0 and accept H_1 at 0.01 level of significance.

Personal/Health Reasons

From calculation as above $D = 0.15$

From table as above $D = \frac{1.63}{\sqrt{N}} = \frac{1.63}{18.08} = 0.09$

$\therefore$ H_0 must be rejected at 0.01 level.

Social/Environmental Reasons

From calculation as above $D = 0.32$

From table as above $D = \frac{1.63}{\sqrt{N}} = \frac{1.63}{30.32} = 0.05$

$\therefore$ H_0 must be rejected at the 0.01 level.

Access Reasons

From calculation as above $D = 0.18$

From table as above $D = \frac{1.63}{\sqrt{N}} = \frac{1.63}{13.89} = 0.117$

$\therefore$ H_0 must be rejected at the 0.01 level.

Involuntary Reasons

From calculation as above $D = 0.10$

From table as above $D = \frac{1.63}{\sqrt{N}} = \frac{1.63}{36.54} = 0.04$

$\therefore$ H_0 must be rejected at the 0.01 level

Appendix 8.2

Spearman Rank Correlation of Proportion of Movers for Involuntary Reasons and Popularity of Estate

Proportion of Invol. Reasons (Rank)	Popularity (Rank)	d	d^2
1	9	8	64
2	8	6	36
3	10	7	49
4	3	1	1
5	6	1	1
6	23	17	289
7	5	2	4
8	13	5	25
9	25	16	256
10	21	11	121
11	7	4	16
12	19	7	49
13	11	2	4
14	30	16	256
15	18	3	9
16	12	4	16
17	22	5	25
18	26	8	64
19	17	2	4
20	1	19	361
21	24	3	9
22	16	6	36
23	4	19	361
24	27	3	9
25	2	23	529
26	15	11	121
27	20	7	49
28	14	14	196
29	29	0	0
30	28	2	4
			Σ2964

$$r_s = \frac{1 - 6\,d^2}{n^3 - n} = \frac{1 - 6 \times 2964}{2700 - 30}$$

$$= 1 - \frac{17784}{26970}$$

$$= 1 - 0.66 = \underline{+ 0.34}$$

From Fig. 34 p.202 (Gregory, 1963)

Not significant at 95% level.

Appendix 8.3. Descriptions of Socio-Economic Groups

S.E.G.

1. Employers and managers in central and local government, industry, commerce in large establishments.
2. Employers and managers in industry, commerce, etc., small establishments, under 25 persons.
3. Professional workers (self employed) university degree qualifications.
4. Professional workers (employees), university qualifications.
5. Intermediate non-manual workers (including supervisors of Group 6, artists, self employed).
6. Junior non-manual workers.
7. Personal service workers (service occupations, food, drink, etc.)
8. Foremen and supervisors, manual.
9. Skilled manual workers.
10. Semi-skilled manual workers.
11. Unskilled manual workers.
12. Own account workers (other than professionals).
13. Farmers (employers and managers).
14. Farmers (own account).
15. Agricultural workers.
16. Members of armed forces.
17. Occupations inadequately described.

Source: Classification of Occupations, 1971 Census.

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